: 978/5

Vol. 978 Number 5

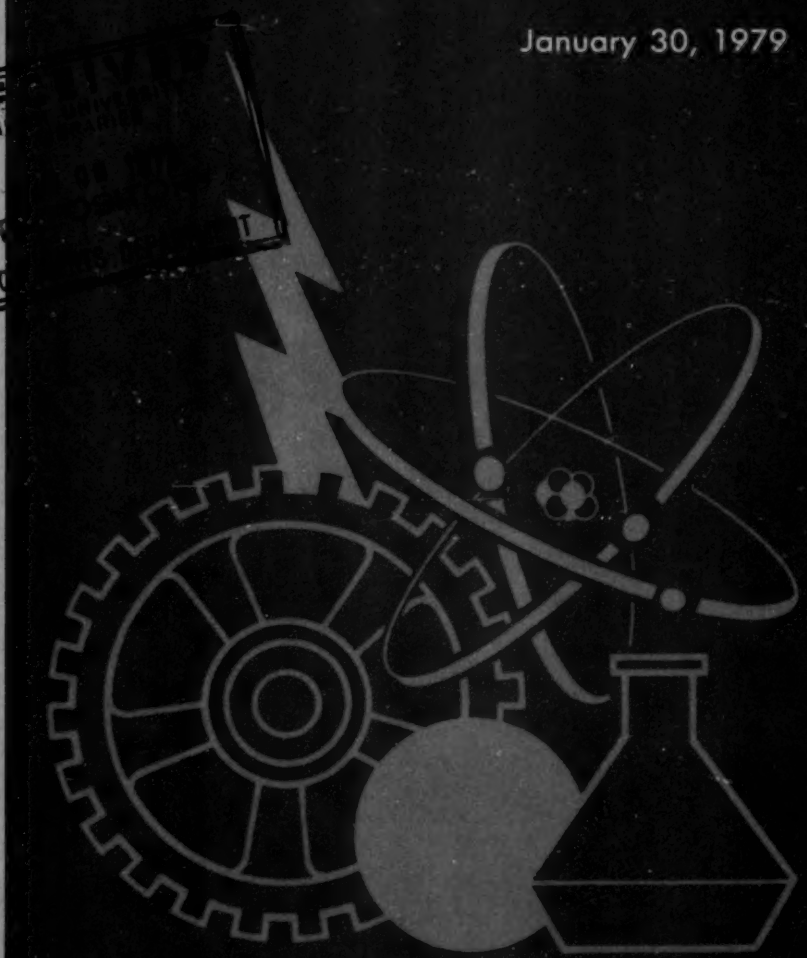
OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

January 30, 1979



U.S.
DEPARTMENT
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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

January 30, 1979 Volume 978 Number 5

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THE OFFICIAL GAZETTE (PATENTS SECTION), issued weekly, subscription $300.00 per annum for first-class mailing, also available as fourth-class mail at $200.00; foreign first-class mailing rates will be furnished upon request; single copies each, $4.00 domestic, $5.00 foreign.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER.
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

National Inventors Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 10, from 1:00 p.m. to 5:00 p.m. and Sunday, February 11, 1979 from 10:30 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the dedication of the National Inventors Hall of Fame and the induction of four inventors into the Hall of Fame at 1:00 p.m. on Sunday, February 11.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 9, 1979.

We would appreciate the cooperation of all users of the Search Room facilities by removing all personal properties and items for the early closing.

LUTRELLE F. PARKER,
For DONALD W. BANNER,
Dec. 7, 1978. *Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of December 1978

Affirmed	115
Affirmed in Part	13
Reversed	43
Total	171

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,961,817, Re. S.N. 963,510, Filed Nov. 24, 1978, Cl. 292/336.3, DOOR LATCH FOR A PRESSURE VESSEL, Albert E. Schrimsher, Owner of Record: *Hobart Corporation, Troy, Ohio,* Attorney or Agent: Lawrence B. Biebel, et al., Ex. Gp.: 351

3,991,717, Re. S.N. 961,274, Filed Nov. 16, 1978, Cl. 119/19, KENNEL, CIRCULAR FACILITY, Robert Royce Buchanan, Owner of Record: *Inventor,* Attorney or Agent: David A. Boone, et al., Ex. Gp.: 333

3,994,510, *Re. S.N. 965,212, Filed Nov. 30, 1978, Cl. 280/432,* TRAILER COUPLING MEANS, Durrell U. Howard, Owner of Record: *Inventor,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 316

4,036,595, Re. S.N. 963,437, Filed Nov. 24, 1978, Cl. 23/273 SP, CONTINUOUS CRYSTAL GROWING FURNACE, Robert E. Lorenzini, et al., Owner of Record: *Inventor,* Attorney or Agent: C. Michael Zimmerman, Ex. Gp.: 171

PATENT NOTICES

Certificates of Correction for the Week of Jan. 30, 1979

Re. 29,540	4,076,599	4,101,721	4,117,035
D. 244,927	4,080,278	4,101,937	4,117,152
D. 249,410	4,080,659	4,101,966	4,117,812
3,693,506	4,083,668	4,102,513	4,117,889
3,808,764	4,086,363	4,102,995	4,118,291
3,840,433	4,086,946	4,104,015	4,118,658
3,880,328	4,090,172	4,104,101	4,118,672
3,912,549	4,090,884	4,104,202	4,118,690
3,941,830	4,091,259	4,105,406	4,118,799
3,944,193	4,093,655	4,106,544	4,120,152
3,991,797	4,093,673	4,112,914	4,120,339
4,016,184	4,094,078	4,113,132	4,120,419
4,031,370	4,094,336	4,113,837	4,120,665
4,055,644	4,095,951	4,114,085	4,121,590
4,058,532	4,096,013	4,115,226	4,121,618
4,059,107	4,098,554	4,115,395	4,121,663
4,059,744	4,098,718	4,115,890	4,122,163
4,064,855	4,099,560	4,116,281	4,122,742
4,065,331	4,100,119	4,116,383	4,122,955
4,069,605	4,100,134	4,116,676	4,123,506
4,074,328	4,100,984	4,116,710	4,123,777
4,075,108	4,101,246	4,116,735	4,123,985

Patents Available for Licensing or Sale

4,027,596. RAPID TRANSIT SYSTEM. Michael A. Nardozzi, Jr., P.O. Box 98127, Pittsburgh, Pa. 15227.

The Henkel Corporation is prepared to offer non-exclusive royalty-bearing licenses on the subject matter claimed in U.S. Patent 4,128,631, METHOD OF IMPARTING LUBRICITY TO KERATINOUS SUBSTRATES AND MUCOUS MEMBRANES.

For further information contact:
Forrest L. Collins
The Henkel Corporation
4620 West 7th St.
Minneapolis, Minn. 55435

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and possibly foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of the patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of the patent applications can be purchased from the National Technical Information Service (NTIS), Springfield, Va. 22161 for $4.00 ($8.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to the public to avoid premature disclosure in the event of an interference before the Patent and Trademark Office. Claims and other technical data will usually be made available to serious prospective licensees by the agency which filed the case.

Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW, Washington, D.C. 20324

Patent application 921,139. High Specific Strength Polycrystalline Titanium-Based Alloys. Filed June 30, 1978.

Patent application 922,603. Control Cable Fail Safe Device. Filed July 7, 1978.

Patent application 922,604. Magazine for Glass Photographic Plates. Filed July 7, 1978.

Patent 4,090,872. Aluminum Base Brazing Alloy. Filed Dec. 29, 1976. Patented May 23, 1978. Not available NTIS.

Patent 4,091,453. Low Offset AC Correlator. Filed Nov. 10, 1976. Patented May 23, 1978. Not available NTIS.

Patent 4,091,460. Quasi Static, Virtually Nonvolatile Random Access Memory Cell. Filed Oct. 5, 1976. Patented May 23, 1978. Not available NTIS.

U.S. DEPARTMENT OF ENERGY

Assistance General Counsel for Patents
Washington, D.C. 20545

Patent application 816,574. Lanthanum Nickel Aluminum Alloy. Filed July 18, 1977.

Patent 4,069,357. Process for Diffusing Metallic Coatings Into Ceramics To Improve Their Voltage Withstanding Capabilities. Filed Nov. 9, 1976. Patented Jan. 17, 1978. Not available NTIS.

Patent 4,069,867. Cyclic Flow Underground Coal Gasification Process. Filed Dec. 17, 1976. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,073,720. Method for Reclaiming Waste Lubricating Oils. Filed Oct. 22, 1976. Patented Feb. 14, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patent Matters, NASA—Code GP–2
Washington, D.C. 20546

Patent application 321,913. Corner Fed Electric Non-Rectangular Microstrip Dipole Antennas. Filed July 3, 1978.

Patent application 895,838. Direction-Finding Array of Crossed Dipoles. Filed Apr. 13, 1978.

Patent application 905,902. TV Bandwidth Reduction System Using a Hybrid Discrete Cosine DPCM. Filed May 15, 1978.

Patent application 913,624. Angle Servo Preamplifier. Filed June 8, 1978.

Patent application 918,203. Dry Ice, Liquid Pulse Pump Cooling System. Filed June 22, 1978.

Patent application 919,195. Corner Fed Electric Rectangular Microstrip Dipole Antenna. Filed June 26, 1978.

Patent application 924,024. Rotor Hub for a Helicopter. Filed July 12, 1978.

Patent application 924,280. Mode Control Apparatus for a Separable-Insert Coaxial Magnetron. Filed July 10, 1978.

Patent 4,055,776. CCD Differential Current Apparatus. Filed Oct. 26, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,068,311. Discrete Transform Systems Using Permuter Memories. Filed Dec. 3, 1976. Patented Jan. 10, 1978. Not available NTIS.

Patent 4,071,012. Fluid Fill or Bleed Apparatus. Filed Apr. 23, 1976. Patented Jan. 31, 1978. Not available NTIS.

Patent 4,078,509. Salvage Apparatus and Method. Filed May 27, 1976. Patented Mar. 14, 1978. Not available NTIS.

Patent 4,086,769. Compound Memory Engine. Filed May 19, 1975. Patented May 2, 1978. Not available NTIS.

Patent 4,087,743. Fog-Water Conductivity Measuring Device. Filed July 21, 1976. Patented May 2, 1978. Not available NTIS.

Patent 4,088,622. Molded Drag Reduction Coatings. Filed June 25, 1976. Patented May 9, 1978. Not available NTIS.

Patent 4,088,623. Coatings That Reduce Flow Resistance and Turbulent Drag at Their Interface With Liquids. Filed June 28, 1976. Patented May 9, 1978. Not available NTIS.

Patent 4,090,193. Frequency Multiplexed Water Leak Detection System. Filed Nov. 24, 1976. Patented May 16, 1978. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626-7555 Ext. 274
	Sunnyvale Patent Library*	(408) 736-0795
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(404) 472-3411
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 18, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-19-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-1-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-29-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-19-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-16-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-17-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-22-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-1-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-16-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	8-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during November 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,007,169 to 3,001,168, inclusive
Plant Patents..... Numbers 2,101 to 2,107, inclusive

REISSUES

JANUARY 30, 1979

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

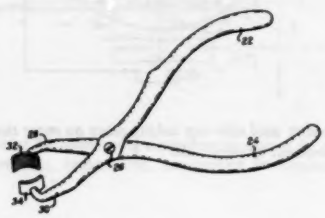
Re. 29,889
CROWN REMOVER

Michael B. Klein, 730 5th Ave., New York, N.Y. 10019

Original No. 3,834,026, dated Sep. 10, 1974, Ser. No. 344,801, Mar. 26, 1973. Application for reissue Nov. 7, 1975, Ser. No. 630,059

Int. Cl.[2] A61C *3/16*

U.S. Cl. 32—43 18 Claims



1. In a dental crown removing pliers, having a pair of opposed arm members pivotally connected to define on one side of the pivot a pair of opposed jaws, the improvement which comprises a resilient deformable gripping surface on at least one jaw, the surface of said jaw generally contoured to coincide with a side surface of a crown or bridge, said resilient deformable gripping surface adapted to hold at least one jaw of said pliers against a portion of the side surface of a crown, the surface of said jaw being made of a porous material which absorbs water.

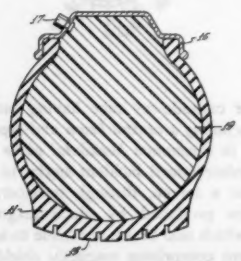
Re. 29,890
FLAT FREE PNEUMATIC TIRE AND VOID FREE FILLING THEREFOR

Edward N. Gomberg, Tustin, Calif., assignor to Synair Corporation, Tustin, Calif.

Original No. 3,866,651, dated Feb. 18, 1975, Ser. No. 404,856, Oct. 10, 1973. Continuation-in-part of Ser. No. 397,940, Sep. 17, 1973, abandoned. Application for reissue Nov. 14, 1977, Ser. No. 851,621

Int. Cl.[2] B60C *1/00*

U.S. Cl. 152—313 8 Claims



1. A flat free pneumatic *tire comprising a pneumatic* tire casing and an essentially void-free polyurethane elastomeric filling material confined, at least in part, by said casing, said elastomeric material being the product of the reaction of, in the essential absence of foam producing material in the reaction zone, a defined prepolymer and a defined other reactant, where

said prepolymer reactant is selected from the class consisting of

1. organic polyisocyanate and hydroxyl group terminated polyfunctional polyether, wherein essentially all the prepolymer terminal groups are isocyanate groups;
2. organic polyisocyanate and hydroxyl group terminated polyfunctional polyester, wherein essentially all the prepolymer terminal groups are isocyanate groups;
3. organic polyisocyanate and hydroxyl group terminated polyfunctional polyether wherein essentially all the prepolymer terminal groups are isocyanate groups which groups have been blocked to afford "isocyanate" reactivity only at elevated temperature; and
4. organic polyisocyanate and hydroxyl group terminated polyfunctional polyester wherein essentially all the prepolymer terminal groups are isocyanate groups which groups have been blocked to afford "isocyanate" reactivity only at elevated temperature;

said other reactant is hydroxyl group terminated polyfunctional polyether, in the case of said prepolymer (1) and said prepolymer (3) to obtain poly(ether)urethane elastomeric material;

said other reactant is hydroxyl group terminated polyfunctional polyester, in the case of said prepolymer (2) and said prepolymer (4) to obtain poly(ester)urethane elastomeric material;

said polyurethane elastomeric material being characterized in part by an essential freedom from voids.

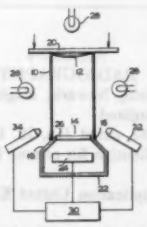
Re. 29,891
SYSTEM FOR DETECTING SMALL OPENINGS IN HOLLOW BODIES

Bryce W. Phillips, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Original No. 3,453,054, dated Jul. 1, 1969, Ser. No. 619,748, Mar. 1, 1967. Application for reissue Aug. 3, 1977, Ser. No. 821,611

Int. Cl.[2] G01N *21/32*

U.S. Cl. 356—237 4 Claims



1. Apparatus for testing for any random perforation in the walls of container bodies having brightly reflective interior surfaces, comprising means to make light-tight engagement with the end of the wall at the open end of a container body, means to sense light passed from within the container body to said open end, and light source means to illuminate the outside of the container body walls to be tested, whereby light from said light source means can pass through any random perforation in said walls to be tested, and thence enter the interior of the container to pass directly or by reflection from *the brightly reflective interior surfaces* within the container body *directly* to the light sensing means, thus indicating whether the container body is perforated.

Re. 29,892

COMPOSITION AND METHOD OF TREATING DOPAMINE DEFICIENCY IN BRAIN TISSUE

Gilbert M. Bayne, Lansdale, Pa., assignor to Merck & Co. Inc., Rahway, N.J.

Original No. 3,769,424, dated Oct. 30, 1973, Ser. No. 77,327, Oct. 1, 1970. Continuation-in-part of Ser. No. 835,730, Jun. 23, 1969, abandoned, which is a continuation-in-part of Ser. No. 764,325, Oct. 1, 1968, abandoned. Application for reissue Apr. 22, 1977, Ser. No. 790,155

Int. Cl.[2] A61K *31/195*

U.S. Cl. 424—319 13 Claims

1. A method of increasing the dopamine content in the brain tissue of an animal which comprises administering to the animal an effective amount of a composition containing a Compound (A) selected from the group consisting of L-dopa and a pharmaceutically acceptable non-toxic salt thereof and a Compound (B) selected from the group consisting of *L-α*-hydrazino-α-lower alkyl-3,4-dihydroxyphenyl propionic acid [and α-hydrazino-3,4-dihydroxyphenyl propionic acid] and a pharmaceutically acceptable non-toxic salt thereof, wherein the ratio of Compound (A) to Compound (B) is from about 0.05 to about 500.

Re. 29,893

LITHOGRAPHIC PRINTING PLATE AND METHOD OF MAKING THE SAME

Michael J. Shaw, Kalamazoo, Mich., assignor to Allied Paper, Inc., Kalamazoo, Mich.

Original No. 3,922,441, dated Nov. 25, 1975, Ser. No. 493,528, Aug. 1, 1974. Application for reissue Jul. 25, 1977, Ser. No. 818,407

Int. Cl.[2] B32B *27/10, 27/20;* B41C *1/10*

U.S. Cl. 428—446 10 Claims

1. In a lithographic printing plate comprising a base and a lithographic printing surface thereon, said printing surface comprising colloidal silica and insolubilized hydrophilic polymer, the improvement comprising; providing a positively charged colloidal silica as said colloidal silica component, wherein said silica and hydrophilic polymer are present in the weight ratio of at least about four parts silica to one part polymer, *the hydrophilic polymer being cationic, nonionic, or a mixture of the same.*

Re. 29,894

RADIOGRAPHY

Godfrey N. Hounsfield, Newark, England, assignor to EMI Limited, Hayes, England

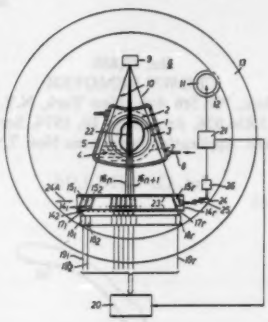
Original No. 3,934,142, dated Jan. 20, 1976, Ser. No. 489,084, Jul. 17, 1974. Application for reissue Feb. 28, 1977, Ser. No. 772,683

Claims priority, application United Kingdom, Jul. 21, 1973, 34859/73

Int. Cl.[2] G03B *41/16*

U.S. Cl. 250—360 6 Claims

1. Radiographic apparatus comprising a source of penetrating radiation arranged to project a swath of radiation across a space for location of a body to be examined, means for collimating the radiation into a set of beams with gaps between adjacent beams, detector means for detecting the respective beams and for producing output signals dependent on the radiation transmitted in said beams, means for orbiting said source, said collimating means, and said detector means in the plane of said swath, and means for additionally displacing at least said collimating means relative to the source so that the relative positions of the beams and the gaps are changed during the orbital movement; *said means for additionally displacing at least said collimating means relative to said source being such that the additional displacement is provided by a side-step of at least said collimating means at a particular angular displacement of the*



orbiting means, said side-step taking place no more than once per orbital movement of about 180°.

Re. 29,895

CONVERGENCE MEANS FOR A PLURAL BEAM COLOR PICTURE TUBE

Hiroshi Murata, Yokohama; Akiyoshi Inose, Tokyo; Masahide Sawai, Ebina, and Yuzo Fuse, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Original No. 3,594,600, dated Jul. 20, 1971, Ser. No. 888,338, Dec. 29, 1969. Application for reissue Nov. 1, 1976, Ser. No. 737,437

Claims priority, application Japan, Dec. 30, 1968, 43-96500

Int. Cl.[2] H01J *29/50, 29/76*

U.S. Cl. 313—411 6 Claims

1. In a color cathode-ray tube having means generating plural beams *including a central beam and opposite side beams which originate in a common horizontal plane and* which are directed, at predetermined incident angles to each other for convergence on a screen, through horizontal and vertical deflection fields produced by electromagnetic deflection means and by which said beams are made to scan said screen, the improvement comprising magnetic shielding means disposed *in advance of said electromagnetic deflection means* adjacent the paths of said beams through said deflection fields and being operative to [selectively] *equally* shield [at least one of] said *opposite side* beams from leakage flux from said horizontal deflection field while permitting said leakage flux to act on [another of said beams] *said central beam* for correcting deviations between the rasters of said plural beams on said screen.

Re. 29,896

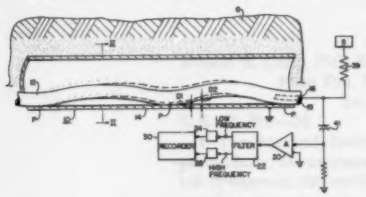
INTRUSION DETECTION SYSTEM

Heinz Gilcher, Export, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Original No. 3,846,780, dated Nov. 5, 1974, Ser. No. 382,264, Jul. 24, 1973. Application for reissue Sep. 1, 1976, Ser. No. 719,500

Int. Cl.[2] G08B *13/16*

U.S. Cl. 340—261 **6 Claims**



13. Apparatus for monitoring disturbances caused by mechanical shock, pressure, impact, etc., comprising in combination, a substantially rigid first electrically conductive member adapted to respond to disturbances, a second electrically conductive member disposed in a loose fitting, intermittent contacting relationship with said first electrically conductive member and being mechanically free to move with respect to said first electrically conductive member, electrical insulating material disposed between said first and second electrically conductive members to establish a capacitance therebetween, a disturbance of said substantially rigid first electrically conductive member resulting in a mechanical displacement and a mechanical vibration of said second electrically conductive member with respect to said first electrically conductive member, said mechanical displacement and mechanical vibration producing a change in said capacitance, said change in capacitance being manifested by the development of an electrical signal, said electrical signal consisting of a first frequency component corresponding to the capacitance change produced by said mechanical displacement of said second electrically conductive member and a second frequency component corresponding to the mechanical vibration of said second electrically conductive member, and circuit means responsive to said electrical signal.

PLANT PATENTS

GRANTED JANUARY 30, 1979

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,372

APPLE TREE

Donald E. Craig, P.O. Box 1416, Chelan, Wash. 98816

Filed Feb. 21, 1978, Ser. No. 879,873

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—35 **1 Claim**

1. The new and distinct variety of apple tree characterized particularly, as contrasted with its parent Oregon Spur, by the ten to fourteen day earlier coloring of its fruit; by the approximately one week earlier ripening of its fruit; and by the stripes of light color underlying the deep and intense overall red color of its fully ripened fruit, substantially as shown and described.

PATENTS

GRANTED JAN. 30, 1979

ERRATA

For CLASS	See PATENT NO.
405–131	4,136,524
340–690	4,136,556
118–060	4,136,613
431–336	4,136,625
188–001 A	4,136,634
422–133	4,137,048
422–056	4,137,049
204–012	4,137,130
204–032 R	4,137,131
204–038 R	4,137,132
204–055 R	4,137,133
521–154	4,137,198
521–138	4,137,199
521–159	4,137,200
528–126	4,137,218
528–177	4,137,219
528–135	4,137,220
528–273	4,137,221
546–242	4,137,231
546–089	4,137,232
546–257	4,137,233
562–477	4,137,258
562–415	4,137,259
562–580	4,137,260
423–300	4,137,330
528–271	4,137,382
260–551 CD	4,137,386
350–039	4,137,493
363–145	4,137,560
363–043	4,137,570

PATENTS

GRANTED JAN. 30, 1979

ERRATA

PATENTS

GRANTED JANUARY 30, 1979

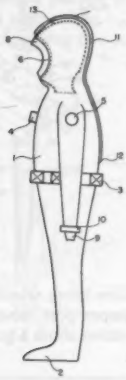
GENERAL AND MECHANICAL

4,136,402

SUIT WITH INNER HOOD

Stig G. E. Insulan, Brasted, and Jørn Stubdal, Fagerstrand, both of Norway, assignors to Viking-Askim A/S, Askin, Norway

Filed Sep. 8, 1977, Ser. No. 831,557
Claims priority, application Norway, Sep. 9, 1976, 763090
Int. Cl.[2] B63C *11/04*
U.S. Cl. 2—2.1 R **14 Claims**



1. A unitary dry protective water and air impervious suit adapted to cover the entire body of a wearer except the hands and the face, comprising

a body part having an upper portion sealingly surrounding the neck of a wearer and covering the body below the neck;

said body part being inflatable to provide heat insulation between the body part of the suit and the body of the wearer;

a hood having an opening for the wearer's face and being sealingly connected to said upper portion;

said hood including in overlapping relationship a water and air impervious outer layer, and

an inner layer,

said layers being sealed to one another at said face opening to define with one another an inflatable clearance surrounding the head of the wearer; and

means for communicating with the interior of said body part to provide heat insulation in form of a thermally insulating layer which surrounds the entire body of the wearer except for the face and hands; said suit further comprising a gas and water-proof zipper extending along a vertical centerline of said suit from the vicinity of said face openings rearwardly over said hoods and down the back of the suit.

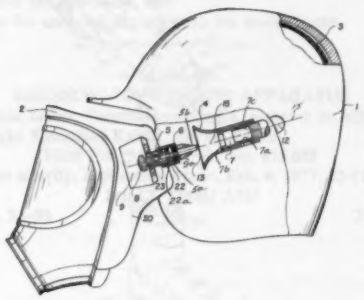
4,136,403

HEAD GUARD ASSEMBLY COMPRISING A PROTECTIVE HELMET AND A PROTECTIVE BREATHING MASK

Hans J. Walther, and Manfred Gdulla, both of Lübeck, Germany, assignors to Dragerwerk Aktiengesellschaft, Germany

Filed Sep. 7, 1977, Ser. No. 831,133
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1976, 2640701
Int. Cl.[2] A42B *3/00*
U.S. Cl. 2—10 **6 Claims**

5. A head guard assembly, comprising a protective head helmet, a face protective breathing mask, and coupling means carried on each respective side of said helmet and said mask for detachably interengaging said helmet and said mask and including a socket-forming member on one of said helmet and mask and a coupling pin on the other of said helmet and mask, said socket-forming member having an oval outwardly tapered receiving socket bore with an internal widened portion defining a catch groove therein, said coupling pin having a necked-down portion, at least one engagement member in said necked-down portion movable radially outwardly into engagement with said catch groove, a sleeve slidable along said coupling pin to engage over said engagement member and retain it in said necked-down portion, biasing means between said sleeve and said coupling pin to urge said sleeve over said engagement member, said coupling member including a head portion of a diameter greater than said necked-down portion displaceable



toward said engagement member when said coupling pin is positioned within said socket-forming member and said sleeve being displaceable against the bias of said biasing means and away from said engagement member when said coupling pin is engaged within said socket forming member so that said head portion of said coupling pin urges said engagement member radially outwardly into engagement with said catch groove through the action of said biasing means whereby said coupling pin may be displaced against the bias of said biasing means to position said necked-down portion adjacent said engagement member to permit the radially inwardly displacement of said engagement member out of engagement with said catch groove and the withdrawal of said coupling pin from said socket-forming member.

4,136,404

ATHLETIC LEG BRACE APPARATUS

Robert B. Lange, 3732 Wonderland Hill Ave., Boulder, Colo. 80302

Filed Mar. 14, 1977, Ser. No. 777,510
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—22 **13 Claims**

1. An athletic leg brace apparatus of the type operable to be connected to the sides of a ski boot comprising:

first lower leg brace means for extending generally vertically along one lateral side of a skiers lower leg;

second lower leg brace means for extending generally vertically along the other lateral side of a skiers lower leg;

first upper leg brace means for extending generally vertically along one lateral side of a skiers upper leg;

second upper leg brace means for extending generally vertically along the other lateral side of a skier's upper leg;

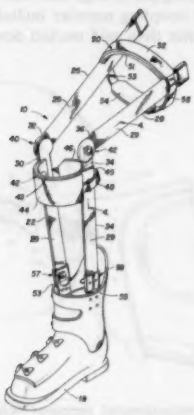
first hinge means connected between an upper portion of said first lower leg brace means and a lower portion of said first upper leg brace means for permitting unencumbered forward and backward flexing of a skier's knee while substantially transmitting lateral forces through said first hinge means;

first resilient means connected to said first hinge means for permitting lateral movement of said first hinge means;

second hinge means connected between an upper portion of said second lower leg brace means and a lower portion of said second upper leg brace means for permitting unencumbered forward and backward flexing of a skiers knee while substantially transmitting lateral forces through said second hinge means;

second resilient means connected to said second hinge means for permitting lateral movement of said second hinge means;

first lateral means connected to said first and second lower leg brace means for securing said first and second lower leg brace means to the lower leg of a skier;



second lateral means connected to said first and second upper leg brace means for securing said first and second upper leg brace means to the upper leg of a skier;

first means at the lower portion of said first lower leg brace means for rigidly connecting said first lower leg brace means to one side of the boot of a skier; and

second means at the lower portion of said second lower leg brace means for rigidly connecting said second lower leg brace means to the other side of the boot of a skier; wherein

lateral flexing of a skiers upper and lower legs will be restricted and lateral forces of a skier's legs will be more effectively transmitted to a skiers boots and the edges of a skier's skis attached thereto.

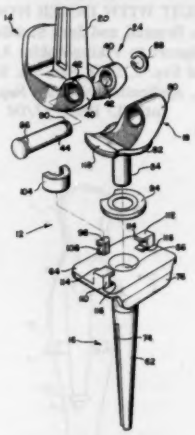
4,136,405

ROTATIONAL OFFSET KNEE PROSTHESIS

Dan L. Pastrick, and John M. McDaniel, both of Warsaw, Ind., assignors to Zimmer U.S.A., Warsaw, Ind.

Filed Apr. 29, 1977, Ser. No. 792,186
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.911 **5 Claims**

1. A knee joint prosthesis comprising: a femoral component including first fixation means defining a generally longitudinal axis and first hinge knuckle means disposed posteriorly of said longitudinal axis to cooperate in defining an offset, lateral-medial pivot axis; a tibial component including second fixation means, a first transverse plateau and a proximal-distal extending tubular bearing; coupling means disposed generally interjacent said femoral and tibial components and including second hinge knuckle means cooperatively interdisposed with said first hinge knuckle means to receive a hinge pintle, a generally proximal-distal aligned pendent axle slidably rotatably received in said tubular bearing and a second transverse plateau confronting said first plateau to transmit vertical load forces therebetween; a hinge pintle slidably and rotatably indwelling said first and second hinge knuckle means; and stop means acting between said first and second plateaus to restrict the arcuate degree of rotation of said axle relative to said tubular bearing, said stop means including bumper post means on one of said plateaus and a pair of spaced notches on the other of



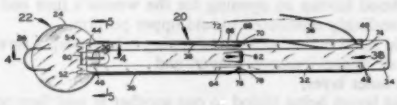
said plateaus, said notches being selectively and alternatively abuttable with said bumper post means to define respective extremes of relative rotation about a generally proximal-distal axis.

4,136,406

INTRAOCULAR LENS WITH ATTACHED DISPOSABLE INSTRUMENT

John W. Norris, 7927 Johnson St., Pembroke Pines, Fla. 33024

Filed Jul. 20, 1977, Ser. No. 817,195
Int. Cl.[2] A61F *1/16, 1/24, 9/0*
U.S. Cl. 3—13 **11 Claims**



1. A disposable tool for intraocularly implanting a pseudophakos having a lens, posterior iris clips and an anterior fastening clasp for insertion in an iridectomy, said tool comprising:

a manually manipulatable tool body for engagement with one of said iris clips;

slide means movably connected to said tool body for releaseably engaging said fastening clasp;

and fastening means for detachably affixing said pseudophakos to said tool body.

4,136,407

UNDER SPRAY ARRANGEMENT FOR TOILET BOWLS AND THE LIKE

Hans Maurer, Rietholzstrasse 4, Zollikerberg, Switzerland

Filed Aug. 22, 1977, Ser. No. 826,567
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1976, 2646021
Int. Cl.[2] A47K *3/22*
U.S. Cl. 4—7 **9 Claims**

1. In an under spray arrangement for a toilet bowl, comprising:

a cylinder;

means for infeeding pressurized water to the cylinder;

tube means displaceably arranged in said cylinder;

spring means for exerting a restoring force upon said tube for moving said tube means from a work position into a rest position;

means closing the upstream end of said tube means in order to form a piston structure;

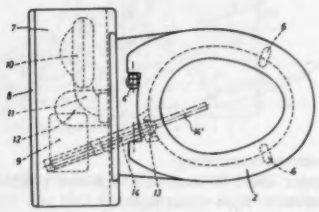
said cylinder having an inner wall;

sealing means for urging the piston structure with pressure against the inner wall of the cylinder and for sealing said piston structure with respect to said cylinder-inner wall;

said cylinder including a spatial region containing the pressurized water in the work position of said tube means;

annular channel means in said sealing means for flow communicationg the spatial portion of the cylinder with the inner space of said tube means;

said sealing means comprising two substantially ring-shaped



sealing elements arranged in spaced relationship from one another, one on the upstream side and the other on the downstream side of said channel means;

said tube means including a tube section located between said sealing elements;

said tube section having passage means penetrating the the wall of said tube means and leading from said channel means into the inner space of said tube means; and

by-pass means located at the work position of said sealing means for by-passing water from the spatial region of said cylinder into said channel means,

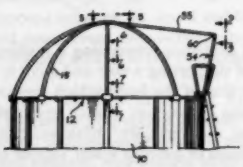
the combination in which, the downstream sealing element bears at a pressure against the inner wall of the cylinder which is smaller than the pressure with which the upstream sealing element bears against the inner wall of the cylinder.

4,136,408

LIGHTWEIGHT REMOVABLE COVER FOR A POOL, GREENHOUSE OR THE LIKE

Edwin L. Dahlbeck, and Verna H. Dahlbeck, both of 739 N. 198th, Seattle, Wash. 98133

Filed Nov. 24, 1976, Ser. No. 744,729
Int. Cl.[2] E04H *3/16, 3/18;* E03C *1/00*
U.S. Cl. 4—172.12 **11 Claims**



1. Apparatus for supporting a flexible cover over an enclosure such as a swimming pool, greenhouse or the like, comprising:

a peripheral lower frame having an outer surface,

a plurality of curved, interconnected tubular supports coupled to the lower frame overlying the enclosure and spaced along the length thereof,

a plurality of generally parallel elongated rigid stabilizer members located above the peripheral lower frame and interconnecting said tubular supports for rigidifying the supports, one of said stabilizers including a central ridge pole running along the top of the curvature of the tubular supports and, flexible guy lines coupled to the top of the supports adjacent to each end of the enclosure and coupled at lower ends to said peripheral frame adjacent opposite ends of the enclosure for stabilizing against lengthwise movement,

a flexible cover overlying said lines, supports, stabilizer members and flexible guy lines for covering the space above the enclosure, and

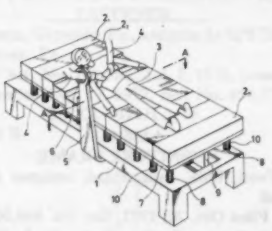
means for securing the cover to the lower frame.

4,136,409

DRESSING-UNDRESSING APPARATUS

Michiyasu Ishida, Nagaokakyo, Japan, assignor to Mitsubishi Jukogko Kabushiki Kaisha, Toyko, Japan

Filed Feb. 3, 1978, Ser. No. 875,085
Claims priority, application Japan, Feb. 4, 1977, 52-11668[U]
Int. Cl.[2] A61G *7/00*
U.S. Cl. 5—91 **3 Claims**



1. A dressing-undressing apparatus comprising a bed frame, a plurality of mattress elements arranged parallelly in a row to form a mattress on said bed frame, said mattress elements being adapted to rise and fall or sink individually, a guide assembly mounted longitudinally of said bed frame, an actuating mechanism adapted to travel along said guide assembly to raise or lower said mattress elements individually, and an upright operating lever secured at the lower end to said actuating mechanism and having a ring formed at the upper free end through which the nurse can put one of his or her arms.

4,136,410

SPRING DECK FOR SEATING STRUCTURES

Thomas E. Vandenbark, Martinsville, Ind., and John H. Patrick, Carthage, Mo., assignors to Flex-O-Lators, Inc., Carthage, Mo.

Filed Nov. 30, 1977, Ser. No. 855,826
Int. Cl.[2] A47C *27/22*
U.S. Cl. 5—190 **9 Claims**

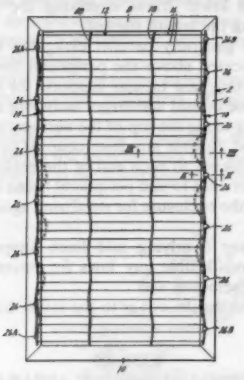
1. A spring deck for supporting padding material in seating or bedding structures, said deck comprising:

a. an open rigid frame having generally parallel side legs,

b. a wire fabric sheet substantially covering said frame and consisting of a pair of resilient, normally straight side wires disposed respectively adjacent the side legs of said frame, and a continuous series of closely spaced cross wires extending transversely between and secured at their ends to said side wires, and

c. means connecting each of said side wires unyieldably to

the adjacent side frame leg at spaced apart points along the length thereof, the points of attachment of one of said wires to its frame leg being staggered relative to the points



of attachment of the other side wire to its frame leg to lie therebetween, considered longitudinally of said side wires.

4,136,411

FURNITURE FRAME

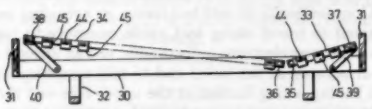
Hansruedi Fanti, Fliih, Switzerland, assignor to Matra AG, Switzerland

Filed Oct. 20, 1977, Ser. No. 844,061

Claims priority, application Switzerland, Oct. 22, 1976, 13375/76

Int. Cl.² A47C *23/06*

U.S. Cl. 5—191 **17 Claims**



1. A furniture frame comprising:

(a) a pair of laterally spaced relatively elongated carrier members each provided with a plurality of longitudinally spaced recesses,

(b) a plurality of retaining members each having a recess engaging portion located in a respective one of said recesses,

(c) a plurality of cross-battens each extending between a respective pair of said retaining members, and

(d) a respective elastic member detachably retained by each of said retaining members and supporting a cross-batten; each retaining member comprising a bearing portion having two opposite sides, with one side bearing against a respective one of said carrier members, and two side portions and at least one base portion on the other side of said bearing portion, said elastic member being retained by said two side portions, said at least one base portion and at least part of said bearing portion.

4,136,412

AIR MATTRESS

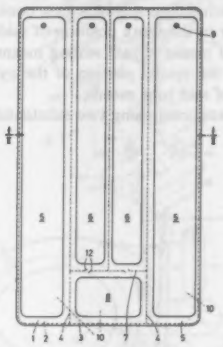
Manfred Wilhelm, Siegen, Germany, assignor to Josef Meier, Liechtenstein

Filed Nov. 30, 1977, Ser. No. 856,122

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1977, 2740412

Int. Cl.² A47G *9/08*; A47C *27/08*

U.S. Cl. 5—344 **10 Claims**



1. Air mattress comprising:

(a) an upper sheet formed of a polymer plastic which is transparent to ultra-violet light,

(b) a lower sheet formed of air-tight material, and

(c) a layer of ultra-violet light reflective material on the upper surface of the lower sheet divided into a grid-like pattern comprising a plurality of individual reflective areas divided by non-reflective areas, the two sheets being sealed together to form a plurality of air-tight pockets in which substantial portions of the sheets are held in spaced relationship so that a person lying on the upper sheet not only receives ultra-violet light directly on his upwardly-directed surface, but also receives ultra-violet light indirectly on his downwardly-surface, at least one of the pockets being provided with a closable filling hole.

4,136,413

SUPPORT APPLIANCE

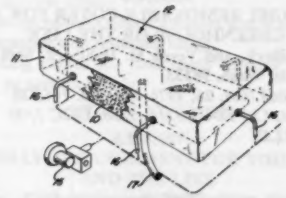
John T. Scales, Stanmore, England, assignor to The Institute of Orthopaedics, London, England

Filed Nov. 4, 1977, Ser. No. 848,520

Claims priority, application United Kingdom, Nov. 8, 1976, 46432/76

Int. Cl.² A47C *27/08, 29/00*

U.S. Cl. 5—365 **11 Claims**

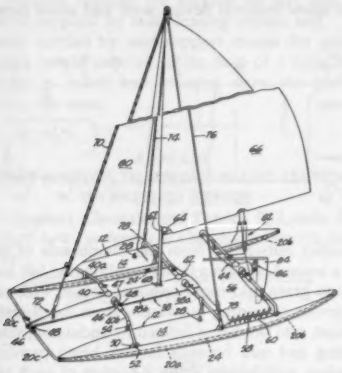


1. A support appliance comprising a resilient air permeable body capable of supporting a user and a cover extending over at least that portion of the body which supports the user, the cover comprising a two-way stretch material which is free-water proof but is chemically/physico-chemically porous to permit transmission of gaseous water vapour on the outside of said portion of the surface area to within the body and from which the water vapour can be dispersed when subjected to a differential water vapour pressure.

4,136,414
KNOCKDOWN BOAT WITH INFLATABLE HULL

John R. Popkin, Apt. 303, 739 S. Normandie, Los Angeles, Calif. 90005

Filed Jul. 11, 1977, Ser. No. 814,229
Int. Cl.[2] B63B 7/00
U.S. Cl. 9—2 A 17 Claims



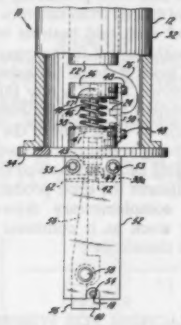
1. A knockdown boat structure, comprising:
(a) at least one hull structure formed by an elongate relatively low pressure inflatable envelope of a pliable fabric material;
(b) said envelope being tapered from substantially its midlength towards generally pointed opposite ends;
(c) a built-in tubular elongate surface sleeve portion extending generally between the ends of said envelope;
(d) elongate rigid reinforcing means extending lengthwise within said sleeve, comprising an elongated light weight tubular member;
(e) a longitudinally rigid non-inflatable frame member extending in generally parallel laterally offset relation to said envelope;
(f) fore, mid and aft bridging members independently connecting said envelope and said frame member;
(g) means detachably connecting said bridging members to said envelope independently of said tubular member.

4,136,415
UNDERWATER RELEASE MECHANISM

James E. Blockburger, 290 Wiley Pl., Wyckoff, N.J. 07481

Filed Apr. 29, 1977, Ser. No. 792,213
Int. Cl.[2] B63B 21/52
U.S. Cl. 9—8 R 10 Claims

1. An underwater release mechanism for a shackle comprising:
(a) a casing having an upper and a lower member;
(b) a shaft affixed to the upper member and shiftably journaled to the lower member from a normally extended position to a retracted position;
(c) a frangible link externally connected between the upper and the lower members;
(d) a spring disposed between the upper and the lower members and held compressed therebetween by the link;
(e) a retaining bracket affixed to the casing below the lower member;
(f) a shackle hook pivotally connected to the retaining bracket and lockable by the end of the shaft when the shaft is in its extended position and releasable when the shaft is in its retracted position, said shackle hook having a hook end;
(g) a shackle slot having an open end formed in the free end of the retaining bracket to receive a shackle normally held captive therein by the hooked end of the shackle hook lying adjacent to and overlapping the slot;
(h) actuating means carried in the casing to operate responsive to a remotely induced signal to cause the link to

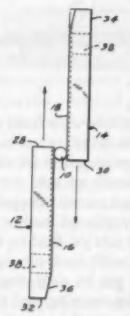


fracture and force the shaft into the retracted position releasing the shackle hook to permit the hook to rotate its hooked end away from the shackle whereby a shackle will be separated from the release mechanism.

4,136,416
METHOD OF PRODUCING A VIBRATION RESISTANT FASTENER

William J. Thomas, Glenside, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Continuation of Ser. No. 701,783, Jul. 1, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 844,170
Int. Cl.[2] B21H 3/06
U.S. Cl. 10—10 R 4 Claims



1. A method of producing a vibration resistant fastener having a shank with at least a portion of its length provided with an external helical thread configuration including a root, a crest and a flank therebetween having a plurality of skewed ramp and buttress configuration serrations thereon, comprising the steps of: providing die members having ribs for forming the external
thread on round stock material, each said die member including a segment having serrations provided on one side of each said rib within said segment for imparting a complementary irregular serration configuration on the load bearing flank surface of the fastener being produced, each of said serrations being in the form of teeth extending inwardly from the crest producing portion of said ribs to termination inwardly of the pitch diameter at a point spaced from the root producing portion of said ribs, each of said teeth comprising an inclined ramp portion extend-

ing from a root to a crest thereof with a buttress extending between said crest and the root of an adjacent serration in a plane generally parallel with the longitudinal axis of the fastener being produced, the height of said buttress between said crest and the root of an adjacent serration being greater at said crest producing portion of said ribs than at said point spaced from said root producing portion of said ribs, and each said buttress being oriented at a skewed angle with respect to the crests of said ribs;

rolling the round stock material between said die members to form the external helical screw threads on a portion thereof and to impart the complementary irregular serration configuration on a segment of the load bearing flank of the fastener being rolled therebetween; and

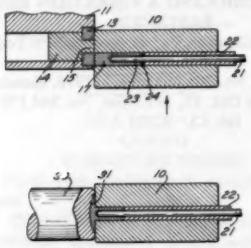
smoothly disengaging each said skewed angle buttress on the die members adjacent the crest producing portion of the ribs from the complementary skewed angle buttress formed on the stock as it continues rotating, without tearing material therefrom.

4,136,417

METHOD AND MACHINE FOR FORMING A HOLLOW RIVET

David L. Dahmen, and Luis Zapata, both of Barranquilla, Colombia, assignors to Remaches Industriales S.A., Barranquilla, Colombia

Filed May 2, 1977, Ser. No. 793,127
Int. Cl.[2] B21K 1/60
U.S. Cl. 10—27 R **14 Claims**



1. In a rivet forming machine, a fixed closed die having an axial opening therein with an entrance mouth, means movable laterally of said axial opening for introducing a cylindrical blank axially into the mouth of said die opening, said blank having opposite ends, said means comprising a closed carrier for a blank and an axially aligned pusher pin moving together laterally with the closed carrier, first to align the blank in the carrier and pusher pin with said die opening and then for movement of the pusher pin by cam means to place the blank into the mouth of this die opening and thereafter to laterally retract said carrier relative to the axis of said opening to position the carrier to close the mouth of the opening and act as an anvil means at one end of the blank after the blank is inserted in the fixed die, an extrusion pin, means to advance the pin axially in the opening of the fixed die toward the mouth of the opening to engage the blank and force it against said anvil means to form an axial recess therein at the other end of the blank.

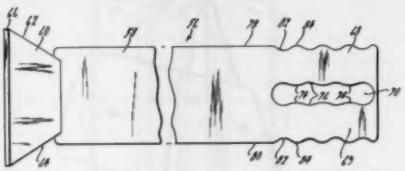
4,136,418

SNOW REMOVAL DEVICE

James M. Griswold, 181 Raymond St., Pontiac, Mich. 48058

Filed Jul. 22, 1977, Ser. No. 818,209
Int. Cl.[2] A46B 5/02, 17/08
U.S. Cl. 15—111 **2 Claims**

1. A snow removal device comprising an elongated generally rectangular housing having a substantially transverse width; a plurality of bristles covering substantially an entire lower surface of said housing and projecting outwardly therefrom, said bristles being of a generous length; and said housing having an integral hand grip adjacent one end provided thereon adapted to provide a comfortable engagement with the hand of an individual; and a scraper blade associated therewith, said scraper blade extending outward from another surface of said housing individual; said hand grip including an elongated slot in said housing adjacent one end so as to define a first portion adapted to allow the right hand of an individual to grasp said snow removal device with said snow removal device extending outwardly from the thumb side of said right hand and a second portion adapted to allow the left hand of an individual to grasp said snow removal device with said snow removal device extending outwardly from the thumb side of said left hand; said slot being defined by undulating sidewalls in said housing and said housing further being provided with corresponding undulations along a portion of each of the lateral sidewalls of said housing, said portions being opposite and coextensive with said elongated slot.

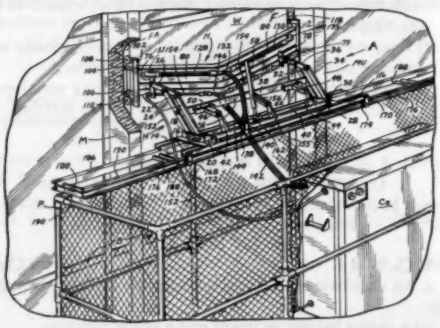


4,136,419

APPARATUS FOR CLEANING A COLUMN OF WINDOWS AND WALL SURFACES OF A BUILDING

Frank W. Hetman, Minneapolis; Kenneth D. Rakouska, Excelsior, and Robert N. Baron, Champlin, all of Minn., assignors to Alpana Aluminum Products, Inc., Minneapolis, Minn.

Filed May 2, 1977, Ser. No. 792,972
Int. Cl.[2] A47L 1/04
U.S. Cl. 15—302 **10 Claims**



1. An apparatus for cleaning a column of windows and/or wall surfaces of a building in combination with a platform having a support railing spanning a plurality of vertical columns of windows and movable up and down on the building comprising:

(a) support means,

(b) cleaning means for the window and/or wall surfaces,

(c) means movably mounting said cleaning means on said support means allowing movement of said cleaning means in substantially a horizontal plane from a non-cleaning position spaced from a window to a position upon a window for the cleaning thereof,

(d) means mounting said support means translatably on said support railing for the purposes of both accommodating unevenness in the mullion surfaces of a building as the

apparatus is moved upon a building vertically during cleaning, and for allowing said support means to be moved from one column of windows to another column,

(e) means carried by the platform for supplying cleaning material to the cleaning means,

(f) said cleaning means including a vacuum housing, and

(g) means carried by the platform for supplying a vacuum to said vacuum housing for picking up dirt and cleaning material supplied by said cleaning means, and

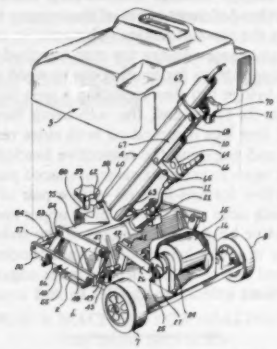
(h) means carried by said support means for guiding the cleaning means relative to the face of a building as the platform is raised and lowered upon the building for cleaning the same.

4,136,420

CARPET SOIL EXTRACTING WAND HAVING A POWERED BRUSH

Gilbert C. Cyphert, Glendale, and Patrick E. Lynch, Jr., Phoenix, both of Ariz., assignors to Chemko Industries, Inc., Phoenix, Ariz.

Filed Apr. 15, 1977, Ser. No. 787,932
Int. Cl.[2] A47L *7/00, 11/34*
U.S. Cl. 15—321 **27 Claims**



1. A wand of a carpet soil extractor for cleaning carpets, said wand including a vacuum conduit connectable with a source of vacuum, a cleaning solution conduit connectable with a source of cleaning solution under pressure and electrical conductors connectable to a source of electric power, said wand comprising in combination:

a. a chassis;

b. wheel means secured at one end of said chassis for aiding in the transport of said wand across the carpet to be cleaned;

c. said chassis including vacuum head means in fluid communication with the vacuum conduit for extracting a mixture of dirt and cleaning solution from the carpet, said vacuum head means including a snout bearing against the carpet and providing vertical support for said wand;

d. weight means for increasing the pressure of said snout acting upon the carpet to urge penetration of said snout into the nap of the carpet;

e. said chassis including nozzle means in fluid communication with the cleaning solution conduit for directing the cleaning solution into the carpet;

f. brush means for scrubbing the carpet wetted with the cleaning solution, said brush means including:

(1) a generally downwardly directed brush;

(2) an electric motor having a rotary output, said motor being electrically connected to the electrical conductors;

(3) linkage means interconnecting the rotary output and said brush for translating the motion of the rotary output to a reciprocal arcuate motion of said brush; and

(4) pivot means for pivotally supporting said linkage means and said brush with respect to said chassis; and

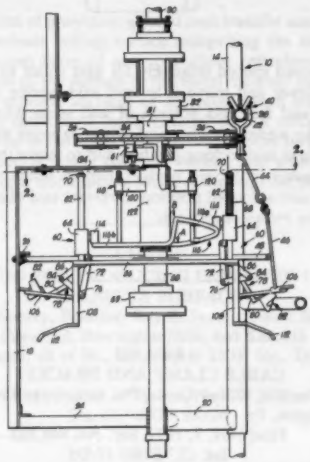
g. bias means disposed intermediate said chassis and said brush for urging said brush into continuing contact with the carpet.

4,136,421

METHOD AND APPARATUS FOR OPENING THE BODY CAVITY OF POULTRY

Donald J. Scheier, Kansas City, and Henry E. Frederick, Parkville, both of Mo., assignors to Gordon Johnson Company, Kansas City, Mo.

Filed Sep. 22, 1977, Ser. No. 835,671
Int. Cl.[2] A22C *25/18, 21/00*
U.S. Cl. 17—52 **20 Claims**



1. In apparatus for making a slit between a hole at the vent of a bird and its keel bone so as to provide an enlarged opening to the body cavity, the improvement comprising:

a knife swingable between a cocked position and an operated position and provided with a cutting edge;

means for locating a bird such that during initial entry of the knife into the hole from the operated position outside of the hole said knife swings through a cocking stroke toward said cocked position and generally away from said keel bone with said cutting edge trailing,

said locating means positioning the bird such that said knife swings generally toward said keel bone with said cutting edge leading as the knife is swung through a slitting stroke toward said operated position; and

means for effecting said swinging movement of the knife.

4,136,422

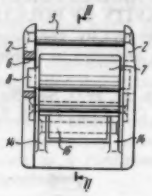
TENSIONING AND LOCKING STRAP DEVICE

Jury N. Ivanov, Oruzheiny pereulok, 5-9, kv. 60; Leonid I. Suris, Smolnaya ulitsa, 31, kv. 85; Nikolai M. Zaitsev, Smolnaya ulitsa, 31, kv. 116, and Vladimir G. Shikin, Preobrazhensky val, 14, kv. 8, all of Moscow, U.S.S.R.

Filed Apr. 22, 1977, Ser. No. 789,863
Int. Cl.[2] A44B *11/10, 11/25*; B61D *45/00*; B64D *9/00*
U.S. Cl. 24—170 **3 Claims**

1. A strap tensioning and locking device comprising, a frame having two laterally spaced side webs having opposed elongated grooves, a wedge member extending transversely between the side webs and movable axially on said webs in the grooves, a clamping lever pivotally mounted between the side webs to press a free end portion of a strap received between it and the wedge member reversely folded over the wedge member to clamp the strap therebetween, a control lever pivotally

mounted on said frame and having two lugs spaced laterally, said control lever being operable to a locking position for effecting clamping of the strap and to an unlocked position releasing the strap, an elongated roller shaft extending transversely of the frame between the lugs, a pivot for said control lever disposed in a plane spaced laterally from a plane passing through an axis of rotation of said roller, said pivot and roller



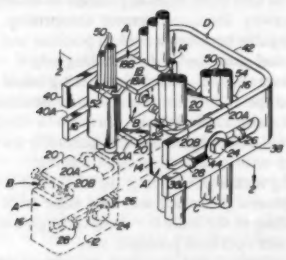
being disposed spaced relatively for said roller to engage the clamping lever and move it toward said wedge member for clamping said free end portion of said strap when disposed between the wedge member and clamping lever and said control lever is in said locking position and to move the roller in a direction away from said wedge member when said control lever is in said unlocked position to release said clamping lever and thereby release said strap.

4,136,423

CABLE CLAMP AND BRACKET

Maurice Sterling, Willow Grove, Pa., assignor to Eby Company, Philadelphia, Pa.

Filed Nov. 7, 1977, Ser. No. 849,323
Int. Cl.[2] F16G *11/06*
U.S. Cl. 24—122.6 **4 Claims**



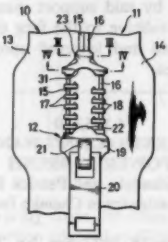
1. An electrical cable clamp for retaining one or more multiconductor cables in fixed disposition comprising a body portion and a jaw movable with respect thereto, said body portion constituting a resilient sheet metal stamping formed into hollow open-ended boxlike configuration including a substantially flat base, planar end walls extending at generally right angles to opposed margins of said base, said walls being outwardly yielding, and a pair of lateral walls spaced intermediate said end walls whereby the edges of said lateral walls define a pair of U-shaped channels with the adjacent end wall, said jaw interfitting between said lateral walls and having a pair of symmetrically disposed concave wings having an apex portion and locationally mounted adjacent said end walls and slidably contiguous with respect to said end walls for preventing pinching of said cables between said wings and end walls, and means to draw said jaw into compressive engagement with cables nested within said channels.

4,136,424

BRIDGE TOP STOP FOR SLIDE FASTENERS

Kihei Takahashi, Uozu, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Feb. 6, 1978, Ser. No. 875,142
Claims priority, application Japan, Feb. 10, 1977, 52-16722
Int. Cl.[2] A44B *19/36*
U.S. Cl. 24—205.11 R **4 Claims**



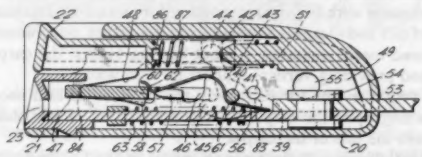
1. A slide fastener comprising a pair of stringer tapes having beaded inner edges, rows of interlocking fastener elements attached to the beaded inner edges of the stringer tapes, a slider movable along the rows of fastener elements for engaging and disengaging same, and a bridge top stop attached to the upper ends of the stringer tapes for limiting the upward movement of the slider, the bridge top stop including a web having a lower end wider than its upper end, the web being formed integral with a pair of first legs disposed on both sides respectively of its lower end and engaging the respective beaded inner edges of the stringer tapes to maintain same in spaced parallelism, the web being further formed integral with a pair of second legs disposed on both sides respectively of its upper end and engaging the respective beaded inner edges of the stringer tapes to maintain same in close juxtaposition, said second legs being disposed around and over said beaded inner edges and having their end portions extending parallel to and contacting each other.

4,136,425

ANCHORING DEVICES FOR VEHICLE SAFETY BELTS AND HARNESSES

Mark E. Esner, London, England, assignor to Howard Wall Limited, London, England

Filed Dec. 12, 1977, Ser. No. 859,750
Claims priority, application United Kingdom, Dec. 13, 1976, 51980/76; Jul. 8, 1977, 28669/77
Int. Cl.[2] A44B *11/25*
U.S. Cl. 24—230 A **8 Claims**



1. A buckle mechanism comprising:
a locking plate having a face, a forward end and an opening defined therein and means connected to a rear end thereof for attaching said plate to a vehicle;
a buckle means having a hollow casing, said casing having a top, bottom, sides and ends with a mouth being defined in one of said ends for receiving said locking plate;
means for attaching said buckle means to a vehicle;
channel defining means defining a channel in said casing, said channel having a base and a longitudinal axis;

flanges mounted on said casing in said channel;

a slider slidably mounted on said flanges and having an end located adjacent said casing mouth, said locking plate having a face presented toward said slider when said locking plate is received in said casing;

a latch plate pivotally mounted at one end thereof in said channel and including an arm on another end to be located remote from said one end, said arm extending forwardly and away from said latch plate, and a tooth positioned between and separating said latch plate arm and said one end to engage said locking plate opening when said locking plate is received in said casing;

a double ended lever swingably mounted on said casing to move along a path having a portion thereof oriented at right angles to said channel longitudinal axis;

one end of said lever contacting said slider directly and another end of said lever contacting said latch plate arm directly and being located farther from said slider than said locking plate face thereby locating said locking plate between said lever another end and said slider so that said latch plate arm is lifted by said lever another end upon actuation of said slider to lift said latch plate tooth out of engagement with said locking plate opening when said locking plate is received in said casing; and

an ejection spring mounted in said casing and engaging said locking plate forward end when said locking plate is received in said casing for ejecting said locking plate from said casing when said latch plate tooth is disengaged from said locking plate opening.

4,136,426

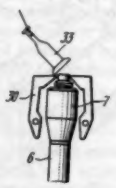
SPINDLE FOR A MACHINE FOR SEALING ELECTRIC VACUUM DEVICES

Valentin T. Samonov, ulitsa Svetotekhniki 53, kv. 49, Saransk Mordovskoi ASSR, U.S.S.R.

Continuation of Ser. No. 715,573, Aug. 18, 1976, abandoned, which is a continuation of Ser. No. 565,458, Apr. 7, 1975, abandoned. This application May 16, 1977, Ser. No. 797,313

Int. Cl.[2] H01J *9/46*

U.S. Cl. 29—25.19 **6 Claims**



1. A spindle for a machine for processing electric vacuum devices, comprising: a housing; a hollow sleeve rotatable mounted in said housing; a central arbor within said hollow sleeve and movable relative thereto; a candle-like plug carried by said central arbor, said candle-like plug having a weld holding a stem of an electric vacuum device; said arbor being axially movable within said sleeve; and stem removal means in contact with said arbor and being actuated when said arbor is moved axially relative to said stem removal means, said stem removal means removing said stem from said candle-like plug when said arbor is displaced axially by a predetermined distance.

4,136,427

METHOD FOR PRODUCING IMPROVED HEAT TRANSFER SURFACE

Ming S. Shum, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 9, 1978, Ser. No. 867,857

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.4 **8 Claims**

1. A method of providing a metal heat transfer member with a porous nucleate boiling surface comprising the steps of applying a porous layer of non-conductive reticulated organic foam material to the surface of the metal member and electroplating the exposed surfaces of the tube which underlie the pores of the reticulated foam material with a metal so as to form a built-up metal surface which overlies the surface of the metal member, is firmly adhered thereto, and which extends outwardly from said exposed surfaces through the pores of the foam.

4,136,428

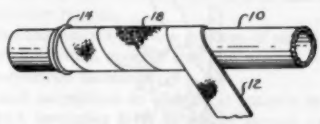
METHOD FOR PRODUCING IMPROVED HEAT TRANSFER SURFACE

Randall D. Godsey, Palatine; Roy E. Svacha, North Barrington; James V. Crawford, Barrington Hills, and Kenneth R. Janowski, Wheaton, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 9, 1978, Ser. No. 867,858

Int. Cl.[2] B23P *15/26*

U.S. Cl. 29—157.4 **8 Claims**



1. A method of providing a metal heat transfer member with a porous nucleate boiling surface comprising the steps of applying a layer of open cell reticulated organic foam material having an adherent coating of conductive graphite to the surface of the metal member and electroplating the exposed graphite coated surfaces of the reticulated foam material and the exposed surfaces of the metal member which underlie the foam material with a metal so as to form a reticulated metal surface having open cells which overlies the surface of the metal member and is firmly adhered thereto.

4,136,429

DEVICE FOR INDEXING AN ARRAY OF SAMPLE CONTAINERS

Walter B. Brandes, Columbia, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 679,540, Apr. 23, 1976, abandoned. This application Sep. 7, 1977, Ser. No. 831,197

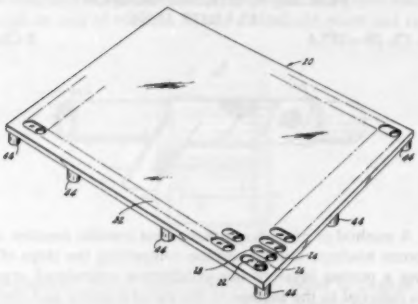
Int. Cl.[2] B23P *19/02*

U.S. Cl. 29—235 **7 Claims**

1. A device for holding a plurality of sample containers in an orderly arrangement, comprising, in combination:

a tray defining an array of indexed container holding stations, said container holding stations each comprising an aperture on said tray dimensioned to receive and support one of said sample containers;

each of said stations including a tag indexed to the station and adapted to automatically grip a sample container as it is positioned in the station, and to ordinarily remain with the sample container when it is removed from the station; said tags each including an indicia-bearing label portion, and



a collar portion adapted to grip one of said sample containers; and

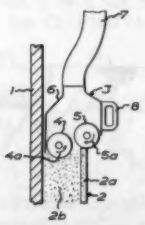
each of said container holding stations comprising means for supporting one of said tags with the collar portion thereof in alignment with the sample container receiving aperture of said station.

4,136,430

METHOD FOR DELINING A FURNACE OR THE LIKE

Nils T. Fridhill, Fru Alstad 1, 231 00 Trelleborg, Sweden

Filed Dec. 23, 1977, Ser. No. 863,869
Claims priority, application Sweden, Dec. 30, 1976, 7614726
Int. Cl.[2] F27D *1/16*; B23C *1/20*
U.S. Cl. 29—427 **4 Claims**



1. A method of delining a furnace or the like, in which the lining consists of a hard, outer layer and a substantially pulverulent or less hard, inner layer, first removing material from the inner layer, and thereafter breaking up the outer layer in those regions where material from the inner layer was removed.

4,136,431

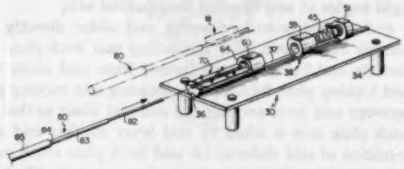
APPARATUS AND METHOD FOR INSERTING INDICIA INTO PENS

Percy A. Tucker, 3401 Markview Ct., Richmond, Va. 23234

Filed Aug. 1, 1977, Ser. No. 821,055
Int. Cl.[2] B23P *19/04*; B31B *43/00*
U.S. Cl. 29—451 **13 Claims**

1. Apparatus for forming and inserting a strip of sheet material into a hollow member comprising, forming means having a tube forming portion, clamping means for urging the hollow member into an abutting relationship with said foaming means so as to be in axial alignment with said tube forming portion of said forming means, means for supporting a generally planar strip of sheet material adjacent to said forming means, said means for supporting a strip of sheet material having a U-shaped channel along the length thereof, said U-shaped channel being disposed in substantial axial alignment with said tube forming portion of said forming means, and mandrel means disposed substantially along the length of said planar strip of sheet material for urging said planar strip of sheet material into said U-shaped channel and for moving the sheet material from said support means through said tube forming portion to form the material into a generally tubular shape and thereafter inserting the tubular shaped material into the hollow member, whereby the relatively flat material is generally simultaneously formed into a tubular shape and inserted into the hollow member.

13. The method of inserting a strip of indicia bearing sheet material into the hollow barrel of a writing implement comprising the steps of: releasably clamping said barrel along a



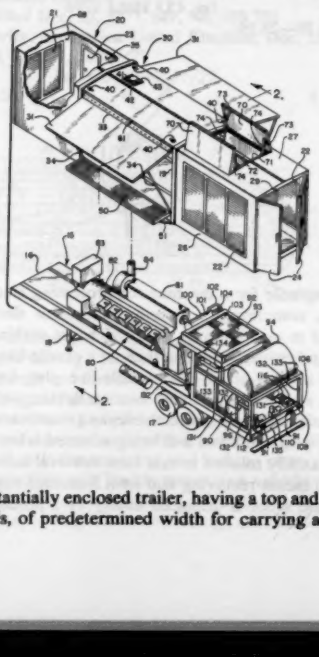
predetermined axis between a movable clamping member and a fixed forming member having a frusto-conical portion axially aligned along said predetermined axis, positioning the strip of generally planar sheet material on a feed guide means adjacent to said forming member so as to be in substantial axial alignment with said axis with the indicia bearing surface of the sheet material positioned in facing relationship with said feed guide means, initially depressing said strip of sheet material against said feed guide means to form a substantially elongated U-shaped configuration and subsequently moving said strip of material along said axis through said frusto-conical portion of said forming means to form said strip into a generally tubular configuration, and substantially simultaneously inserting said tubular strip into said hollow barrel.

4,136,432

MOBILE ELECTRIC POWER GENERATING SYSTEMS

Joseph F. Melley, Jr., Davie, Fla., assignor to Melley Energy Systems, Inc., Fort Lauderdale, Fla.

Filed Jan. 13, 1977, Ser. No. 759,211
Int. Cl.[2] H02P *9/00*
U.S. Cl. 29—469 **4 Claims**



1. In a substantially enclosed trailer, having a top and at least two side walls, of predetermined width for carrying a power

plant having a size less than but substantially equal to the width of said trailer:

means defining an opening in said trailer, for promoting the passage of heat produced by said power plant;

a removable section comprising a portion of said top and portions of said side walls of said trailer, said portions of said top and said side walls forming a substantially rigid structure adapted to be removed from said trailer as a unit to provide access to the top and sides of said power plant from outside said trailer;

automatic means comprising gate means having a first position covering said opening and a second position uncovering said opening, means producing a signal during a start-up condition of said power plant, and means responsive to said signal for actuating said gate means from said first position to said second position; and

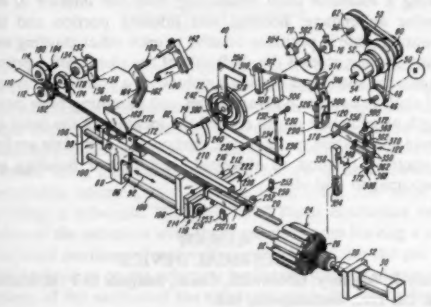
canopy means, forming a portion of at least one of the side walls of said trailer when said canopy means are in a first location, movable from said first location to a second location beyond said predetermined width of said trailer; said canopy means, when in said second location, defining a canopy extending over an area beyond said predetermined width of said trailer permitting access to said power plant from outside said trailer.

4,136,433

INSULATION FEEDING, CUTTING AND INSERTING MACHINES

Francis E. Copeland, Casstown; Glen E. Bucholtz, and Hyman B. Finegold, both of Dayton, all of Ohio, assignors to The Globe Tool and Engineering Company, Dayton, Ohio

Filed Oct. 31, 1977, Ser. No. 847,099
Int. Cl.[2] B23Q *41/02*; H02K *15/00*
U.S. Cl. 29—564.6 **9 Claims**



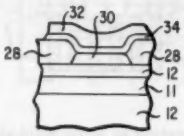
1. Apparatus for inserting insulating members into the slots of dynamoelectric machine members, the apparatus being of the type wherein a strip of insulation material is fed along a predetermined path, a length of said material is cut by a knife assembly to form said insulating member, said insulating member is inserted into a slot in the machine member, and the machine member is then rotated about its axis by index means to position another slot for receiving another insulating member, the improvement wherein said apparatus includes a carriage mounted for movement along a path substantially parallel to the path of movement of said strip, said machine member being supported in substantial alignment with said path, means supporting said knife assembly between said carriage and said machine member, Scotch yoke drive means for reciprocally moving said carriage along said path toward and away from said machine member, means responsive to movement of said carriage for feeding said strip toward said machine member so that its leading edge is moved past said knife assembly, means for operating said knife assembly in timed relation to the movement of said strip to cut said insulating member from said strip, and a ram mounted on said carriage for pushing said insulating member into one of said slots as the carriage moves toward said machine member.

4,136,434

FABRICATION OF SMALL CONTACT OPENINGS IN LARGE-SCALE-INTEGRATED DEVICES

Louis R. Thibault, Piscataway, and Leopoldo D. Yau, New Providence, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 10, 1977, Ser. No. 805,408
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **2 Claims**



1. A method for forming contact windows in a multilayered integrated-circuit device that includes underlying conductive regions to which electrical connections are to be made via contact windows that extend through a relatively thick insulating layer that overlies said underlying regions, said method comprising the steps of

forming a relatively thin layer of polysilicon on said underlying conductive regions,

masking selected contact window portions of said thin layer of polysilicon with a material that will prevent oxidation of the polysilicon thereunder,

oxidizing said polysilicon to convert it entirely to a relatively thick insulating layer of silicon dioxide except in said contact window portions where substantially no conversion occurs,

removing said masking material from said contact window portions,

adding impurities to the unconverted polysilicon in said contact window portions to form conductive regions extending through said relatively thick insulating layer to contact said underlying regions,

wherein said underlying regions comprise the gate, source and drain electrodes of an MOS LSI device, and wherein said masking material comprises a material selected from the group consisting of silicon nitride and aluminum oxide, said method further comprising the step of

patterning said masking material by electron beam lithography utilizing direct writing techniques with a negative electron resist to form said contact window portions in said material,

and wherein said oxidizing step comprises establishing a steam oxygen atmosphere at a pressure of at least one atmosphere at a suitable temperature and for a sufficient time to convert the thin layer of polysilicon to electrically insulating silicon dioxide,

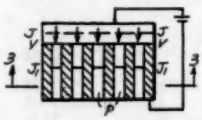
said method further including the step of

forming a relatively thin protective layer of polysilicon on the entire top surface of said device subsequent to said removing step.

4,136,435
METHOD FOR MAKING SOLID-STATE DEVICE

Chou H. Li, 379 Elm Dr., Roslyn, N.Y. 11576

Continuation of Ser. No. 405,138, Oct. 10, 1973, abandoned, and Ser. No. 580,414, May 23, 1975, each is a continuation-in-part of Ser. No. 190,483, Oct. 19, 1971, Pat. No. 3,765,956, and Ser. No. 386,102, Aug. 6, 1973, and Ser. No. 802,018, Feb. 25, 1969, Pat. No. 3,500,135, which is a continuation-in-part of Ser. No. 490,955, Sep. 28, 1965, Pat. No. 3,430,109, said Ser. No. 190,483, is a continuation-in-part of Ser. No. 868,129, Oct. 21, 1969, abandoned, which is a continuation-in-part of Ser. No. 491,718, Sep. 30, 1965, abandoned. This application Jan. 31, 1977, Ser. No. 764,433
Int. Cl.[2] H01L *21/18*
U.S. Cl. 29—572 17 Claims



1. A method of making an active solid-state device comprising the steps of:

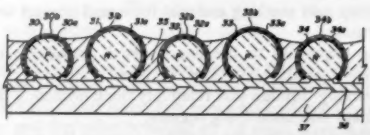
forming a structure having microscopically small first phase bodies spaced from each other by second phase bodies, the bodies of at least one of the phases being a semiconductor substance, the first phase bodies physically contacting the second phase bodies but the structure being crystallographically discontinuous at the physical contact of the first phase bodies with the second phase bodies, said structure including electronic rectifying barriers at the physical contacts between said first phase bodies with said second phase bodies; and

providing electrical contacts to selected locations of at least the bodies of one of the phases.

4,136,436
LIGHT ENERGY CONVERSION

Jack S. Kilby, Dallas, Tex.; Jay W. Lathrop, Clemson, S.C., and Wilbur A. Porter, College Station, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 599,473, Jul. 28, 1975, Pat. No. 4,021,323. This application Dec. 2, 1976, Ser. No. 747,031
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—572 9 Claims



1. A process for forming a solar energy converter strip to be used for direct contact by and current flow through an electrolyte which comprises:

(a) forming first bodies of a first conductivity type semiconductor material each having a surface layer of a second conductivity type material,

(b) forming second bodies of said second conductivity type semiconductor material each having a surface layer of said first conductivity type material,

(c) removably adhering said first and second bodies intermingled in a one level layer on a temporary support,

(d) filling the voids between said bodies above said temporary support,

(e) removing a base side of said one level layer opposite said support to a depth below the surface layers on said bodies,

(f) applying a conductive layer on said base side of said one level layer to interconnect the first conductivity type material of all said first bodies with the second conductivity type material of all said second bodies,

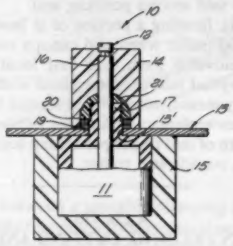
(g) applying a support layer to said conductive layer, and

(h) releasing said one level layer from said temporary support.

4,136,437
METHOD OF MOUNTING A POTENTIOMETER

Lowell J. Leyrer, Costa Mesa, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 28, 1977, Ser. No. 837,453
Int. Cl.[2] H01C *17/00*
U.S. Cl. 29—610 R 7 Claims

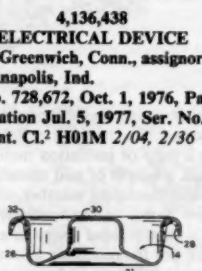


1. The method of assembly, said method comprising the steps of: inserting an annular appendage of a component housing through a hole in a mounting plate from one side thereof, said housing having a portion larger than said hole on the other side of said mounting plate, said housing carrying a component having a rotatable shaft emanating from the interior of said annular appendage; holding said housing portion and said mounting plate in positions relative to each other abutting each other; coating at least the shaft side of the plate with a primer, but not the shaft; and potting a volume of a compound around said shaft in contact with and from said mounting plate over a length of said shaft not to exceed the location of the outer end of said shaft while said housing portion and said plate are held in abutting relation as aforesaid, said primer bonding said compound to said plate.

4,136,438
ELECTRICAL DEVICE

Henry R. Mallory, Greenwich, Conn., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 728,672, Oct. 1, 1976, Pat. No. 4,052,537. This application Jul. 5, 1977, Ser. No. 813,024
Int. Cl.[2] H01M *2/04, 2/36*
U.S. Cl. 29—623.2 8 Claims



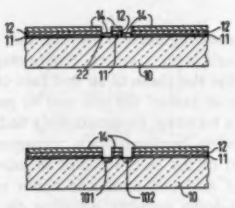
1. A method for forming a pressurized electrical device

comprising the steps of loosely placing a closure on a can body having electrical elements therein and having a torus formed thereon by inwardly rolling the rim of the upper end of the can, sealing the area surrounding the upper end of the can and closure from the external environment, removing the air from the container and from the area surrounding the upper end of the can and closure, filling electrolyte under pressure into the can body through the space between the can and the loosely fitting closure, and thereafter forcing the closure onto the upper edge of the can body and crimping it into sealing relationship with the torus.

4,136,439
METHOD FOR THE PRODUCTION OF A LIGHT CONDUCTOR STRUCTURE WITH INTERLYING ELECTRODES

Franz Auracher, Munich, and Ralf Kersten, Rottach-Egern, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 1, 1977, Ser. No. 783,751
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1976, 2614871
Int. Cl.[2] H01P *11/00*; G02F *1/03*
U.S. Cl. 29—624 **13 Claims**



1. A method of forming a light conductor structure having a pair of light conductors embedded in a substrate consisting of electro-optical materials and said substrate having three electrodes with one electrode being arranged between the light conductors which are between the other two electrodes, said structure being particularly adapted for use as an electrically controllable coupler, said method comprising the steps of providing a substrate, applying three metal electrodes on a surface of the substrate with the three electrodes leaving a pair of exposed portions of said surface, and producing the pair of light conductors on the substrate by doping the pair of exposed portions of the surface of the substrate using the electrodes as a doping mask.

4,136,440
ELECTRICAL HARNESS FABRICATION METHOD AND APPARATUS

Joseph E. Brandewie, Clearwater, Fla.; Kenneth F. Folk, and Milton D. Ross, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 12, 1977, Ser. No. 815,046
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—628 **22 Claims**

1. A method of fabricating an electrical harness, which comprises at least one multi-contact electrical connector and a plurality of insulated wires extending therefrom, said wires generally being of different lengths with diverse segments of insulation removed from the wire ends opposite said connector, said method comprising the steps of:

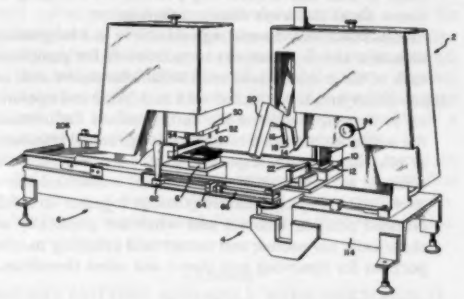
positioning said electrical connector at a first station,

simultaneously feeding first ends of said plurality of wires uniformly past a second station to a first station, said second station being spaced from said first station by a distance no greater than the length of the shortest of said plurality of wires,

inserting said first ends of said wires in said electrical connector at said first station,

forming loops of differential lengths in said wires between said first and second stations,

pressing said wires into axially extending channels adjacent to said second station, each of said channels having a cutting blade therein for partially severing the insulation on said wires,



gripping said wires adjacent to said second station,

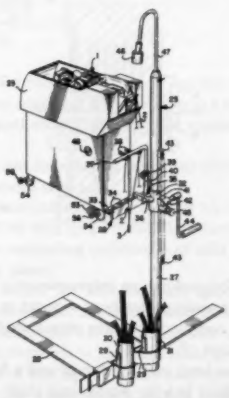
shearing said wires at said second station between said cutting blades and the gripping of said wires, and

imparting an axial force upon said wires between said cutting blades and said first station to draw said wires past said cutting blades and strip the wire insulation which previously had extended between said blades and said sheared end.

4,136,441
APPARATUS AND METHOD FOR BUTT SPLICING WIRES

Dory J. Neale, Sr., Topeka, Kans., assignor to The National Telephone Supply Company, Cleveland, Ohio

Filed Jul. 11, 1977, Ser. No. 814,532
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—628 **24 Claims**



1. An apparatus for trimming end portions of first and second wires and butt splicing the same together by crimping an open sided electrical connecting sleeve onto trimmed wire ends, said apparatus comprising:

(a) a frame;

(b) means on said frame defining a sleeve receiving position and shaped for receiving a sleeve therein;

(c) means positioning said first and second wires longitudi-

nally into said sleeve with the untrimmed free ends of said wires extending outwardly of one end of the sleeve;

(d) cutting means mounted on said frame adjacent to said sleeve receiving position and being operable to trim each wire free end to a predetermined point relative to said sleeve;

(e) crimping members mounted on said frame and having portions thereof movable toward and away from each other at said sleeve receiving position for crimping the sleeve about the wires disposed therein;

(f) means selectively translating said sleeve in a longitudinal direction and with respect to said wires for positioning each of the trimmed wire ends within the sleeve and; and

(g) activator means connected with said frame and operative to, in sequence, activate the cutting means for trimming the wires; activate said means for longitudinal translation of said sleeve with respect to said wires whereby said trimmed wire ends are disposed wholly within said sleeve; move said crimping member portions together to a fully crimped position wherein said wires are physically and electrically connected; and retract said crimping member portions for removing said sleeve and wires therefrom.

4,136,442

INTERCONNECTOR

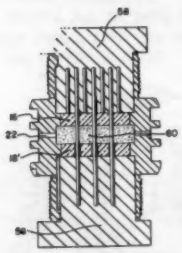
Herbert M. Harnett, Whitstable, England, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 739,912, Nov. 8, 1976, Pat. No. 4,088,381. This application Nov. 3, 1977, Ser. No. 848,059

Claims priority, application United Kingdom, Nov. 19, 1975, 47667/75

Int. Cl.² H01R *43/00*

U.S. Cl. 29—629 **2 Claims**



1. A method for making an interconnector in which two spaced-apart glass sealing members support at least one conductor within a one-piece tubular metal shell, said method comprising the steps of:

arranging said at least one conductor and a first of said glass sealing members in a jig within said shell;

sealing said first sealing member to the inner wall of said shell and to said at least one conductor;

supporting a second of said glass sealing members with a layer of inert flowable material between said two sealing members;

sealing said second sealing member to the inner wall of said shell and to said at least one conductor; and

removing said inert flowable material through at least one port extending through the wall of said shell.

4,136,443

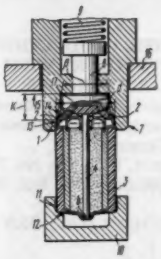
DEVICE FOR SEALING CURRENT SOURCES OF CYLINDRICAL SHAPE WITH ALKALI ELECTROLYTE

Faat K. Nabiullin, 3 Mytischinskaya ulitsa, 14A, kv. 90; Efim M. Gertsik, Malo-Moskovskaya ulitsa, 3, kv. 92; Vyacheslav A. Rabinovich, prospekt Mira, 122, kv. 270, all of Moscow; Vladimir A. Soldatenko, ulitsa Cheljuskintsev, 14, kv. 136, Novosibirsk, and Jury T. Rodionov, prospekt Mira, 190A, kv. 71, Moscow, all of U.S.S.R.

Filed May 3, 1976, Ser. No. 682,388

Int. Cl.² H01M *2/04*

U.S. Cl. 29—731 **8 Claims**



1. A device for sealing current sources, said current sources consisting of a cell with a cover, comprising a hold-down member to position the plane of an end face of the cell cover perpendicular to an axis of the cell and to press it toward a central support; a footstep, for positioning and supporting the cell during its sealing, having a shape corresponding to that of a supporting part of the cell; a means to move said footstep along the axis of said cell until said cover of the cell rests against said hold-down member; a rolling die having a cone-shaped portion with an angle at the cone vertex of about $10\pm5°$ and a stop limiting the movement of said die.

4,136,444

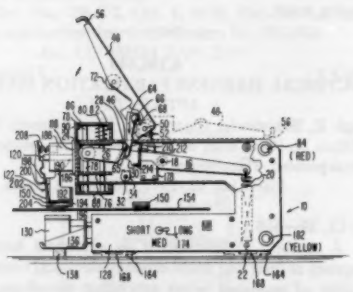
SEMIAUTOMATIC SOLID CHIP REMOVAL APPARATUS

David J. Durney, Holland, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 6, 1977, Ser. No. 803,512

Int. Cl.² B23P *19/00*

U.S. Cl. 29—764 **7 Claims**



1. Portable semiautomatic apparatus for removing dual-in-line solid state chip packages from associated hardware such for example as a printed circuit board comprising:

a frame member providing a support for said apparatus,

first heater means carried by said support providing an anvil for supporting a printed circuit board thereon,

second heater means arranged to straddle said associated

means for moving said second heater means toward and away from said first heater means,

means movable relative to said first and second heater means for mounting a chip holding and extracting member thereon,

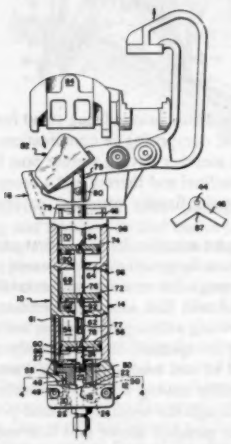
means for electrically energizing said heater means so as to release said chip from said printed circuit board, and

means for driving said chip holding and extracting member in one direction to lower said chip carrying tool toward said first heater means and said printed circuit board and for moving said chip carrying tool in the opposite direction to pull said released chip out away from said printed circuit board upon its release therefrom.

4,136,445
PNEUMATICALLY OPERATED CABLE-SLITTING TOOL

Daniel B. Grubb, Hummelstown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 329,248, Feb. 2, 1973, Pat. No. 4,024,794. This application Feb. 24, 1977, Ser. No. 771,483
Int. Cl.[2] B21F *13/00*
U.S. Cl. 30—90.1 **3 Claims**



1. A three-position tool powered by fluid under pressure and provided with a first fixed jaw and a second reciprocating cutting jaw intended for positive displacement to a first tool position for separating the jaws and permitting insertion and alignment therebetween of a multi-conductor electrical cable, the second jaw being further intended for positive displacement toward said first jaw to a second tool position for clamping said inserted and aligned cable between said jaws, and said second jaw being further intended for additional displacement toward said first jaw to a third tool position for slicing penetration of said second jaw through said cable to separate the individual conductors of said cable without severing the conductors, said tool comprising:

a piston casing to which said first jaw is fixedly secured, said casing being divided into a plurality of chambers,

a piston assembly mounted for reciprocation within at least a first chamber of said casing, said piston assembly protruding from said casing and having said second jaw mounted thereon for reciprocation toward and away from said first jaw,

said piston assembly having at least a first piston received for reciprocation within said first chamber and dividing said first chamber into two portions,

a second piston mounted for reciprocation within a second chamber of said casing and protruding into said first chamber for engagement on said piston assembly,

valve means for selectively introducing fluid under pressure to said first and second chambers,

said valve means being selectively actuable to introduce fluid under pressure to a first portion of said first chamber and thereby slidably displace said piston assembly in a first direction to a first tool position, said second piston being engaged by said piston assembly and being forced to slidably displace in said second chamber also in the first direction,

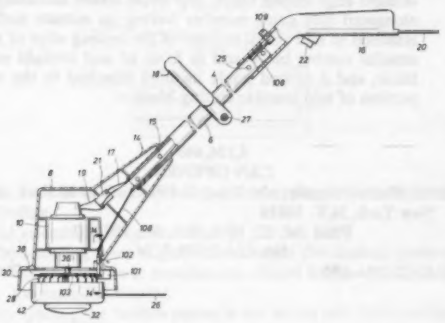
said valve means being selectively actuable to cease the introduction of fluid under pressure into said first portion of said first chamber and to introduce fluid under pressure into said second chamber and thereby slidably displace said second piston in a second direction to forcibly engage and then to forcibly displace said piston assembly in a second direction to a second tool position, and

said valve means being selectively actuable to introduce fluid under pressure into a second portion of said first chamber and thereby slidably displace said piston assembly further in said second direction to a third tool position.

4,136,446
ROTARY CUTTING ASSEMBLY WITH MECHANICAL LINE FEED

Dwight E. Tripp, Longview, Tex., assignor to Weed Eater, Inc., Houston, Tex.

Filed Jan. 24, 1977, Ser. No. 761,942
Int. Cl.[2] A01G *3/06*
U.S. Cl. 30—276 **22 Claims**



1. Apparatus for cutting vegetation and the like, comprising:

(a) head means rotatable about an axis in a cutting plane and carrying spool means mounted for rotation therein about said axis;

(b) driving means for rotating said head means in said cutting plane and about said axis;

(c) a flexible non-metallic line member having a coiled portion carried on said spool means and further having a free end portion extending outwardly of said head means into said cutting plane;

(d) securing means for securing said spool means against rotational movement relative to said head means;

(e) control means for (1) releasing said spool means for rotational movement within said head means; (2) regulating rotation of said spool means only through a predetermined angular displacement within said head means to extend an additional certain length of said line member outwardly from said head means into said cutting plane during rotation of said head means; and then (3) securing said spool means against rotation within said head means upon each actuation of said control means by a user of said apparatus; and

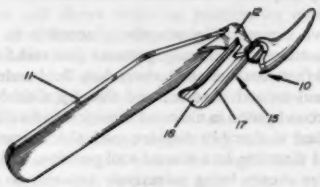
(f) said control means including a floating ring member carried by said head means and braking means adapted to act upon said floating ring.

4,136,447

CORING APPARATUS

Robert E. Gilliam, Sr., 732 N. Halifax Ave., Apt. 101, Daytona Beach, Fla. 32018

Filed Jan. 19, 1978, Ser. No. 870,748
Int. Cl.[2] B26B *27/00, 29/02*
U.S. Cl. 30—287 8 Claims



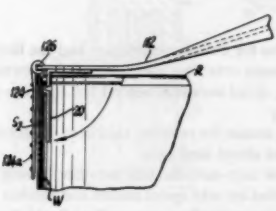
1. A coring apparatus comprising in combination;
a support member;
a shank fixedly attached to said support member and extending therefrom;
a straight edge cutting blade fixedly attached to said shank;
an annular cutting blade fixedly attached to and supported by said straight edge cutting blade; and
guide means attached to said coring apparatus for guiding an elongated member axially into said annular and straight edge cutting blades, thereby coring said elongated member with said annular cutting blade, and cutting an incision to said cored portion of said elongated member with said straight edge coring blade, said guide means including an elongated first guide member having an arcuate surface attached to said shank in front of the cutting edge of said annular cutting blade and in front of said straight edge blade, and a second guide member attached to the rear portion of said annular cutting blade.

4,136,448

CAN OPENER

Erick-Pierre Fournier, and Ethel V. Hill, both of 30 Park Ave., New York, N.Y. 10016

Filed Jul. 22, 1976, Ser. No. 707,707
Int. Cl.[2] B67B *7/24*
U.S. Cl. 30—450 9 Claims



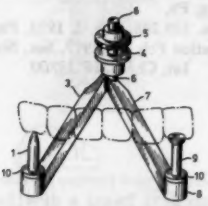
1. A can opener for producing an aperture having a sealable edge in a can top comprising:
integral, plastic lever arm means and manually grippable means, said manually grippable means having a generally U-shaped configuration to provide knuckle support and adapted to be positioned adjacent the wall of said can; a living hinge at the upper end of one leg of said U-shaped configuration for pivotally connecting said lever arm means thereto to provide a fulcrum; the other leg of said U-shaped configuration being bifurcated to define a lever arm receiving zone, said living hinge being operative to permit said U-shaped gripping means to be rotated into overlying relationship with said lever arm means; bridging means extending downwardly from the fulcrum to define a cavity for receiving the rim of the can; and a cutting element including a generally triangular shaped cutting blade depending from said lever arm adjacent the fulcrum, the edges of said blade being adapted and arranged to perforate the can top in the form of a generally triangular shaped flap folded downwardly into the can, said flap being attached to the can top adjacent the rim, and said blade including wedging means for folding a predetermined portion of said flap adjacent the aperture in abutting relationship with the underside of said can top, whereby a sealable edge aperture is produced in said can.

4,136,449

ADJUSTABLE DENTAL BRIDGE FIRING STAND

Evan P. Penrod, 1676 E. 8850 South, and Charles K. West, 256 E. 9585 South, both of Sandy, Utah 84070

Filed Jan. 12, 1977, Ser. No. 758,595
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—2 4 Claims



1. An adjustable dental bridge firing stand for holding dental bridge framework, comprising in combination:
a first elongate member having a pivot post fixedly attached to one longitudinal end thereof and a receptacle having an aperture therein fixedly attached to the opposite end thereof;
a second elongate member having a first receptacle fixedly attached at one longitudinal end thereof having an aperture therethrough for receiving and rotatably holding said pivot post of said first elongate member with said first receptacle having a flat upper surface, and a second receptacle having an aperture therein fixedly attached to the opposite end of said second elongate member;
a securing member having a flat lower surface and an aperture therethrough for securing on said pivot post of said first elongate member above said first receptacle of said second elongate member; and
a pair of support pegs for attachment respectively in said receptacle of the first elongate member and in said second receptacle of the second elongate member whereby said stand is adjustable to hold all sizes, shapes, and types of dental bridge frameworks during the various stages of firing.

4,136,450

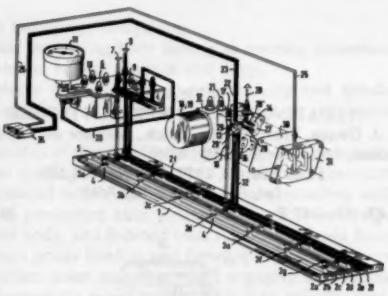
HYDRAULIC-PNEUMATIC CONTROL DEVICE FOR CONTROLLING THE FLOW OF AGENTS TO HAND-HELD DENTAL APPARATUS

Werner Güenther, Bensheim; Franz Stüeber, Bensheim-Auerbach; Manfred Müether, and Hans-Michael Kratochwilla, both of Bensheim, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sep. 3, 1976, Ser. No. 720,251
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1975, 2542177
Int. Cl.[2] A61C *19/02*
U.S. Cl. 32—22 7 Claims

1. A hydraulic-pneumatic control device for regulating the flow of agents to at least one hand-held dental apparatus, said device comprising a narrow, one piece, elongated supply strip having a plurality of channels extending from one end to the other end and parallel to a longitudinal axis of the supply strip,

said supply strip having a plurality of separate groups of openings spaced along the strip with each group having an opening in communication with each channel; a connecting block having a plurality of separate passages for supplying agents to the supply strip, said block being secured on the supply strip with the separate passages in communication with selected channels of the strip; a control block for each of said dental apparatuses whose agents are being regulated, each of said control blocks having channels and being mounted on a separate group of openings of the supply strip with the channels of the control block receiving agents from the channels of the supply strip, each of said control blocks having pneumatically actuated valves for regulating the flow of the agent therethrough, each of said control blocks having a first channels receiving spray air and extending to a first valve of said valves, a second channel receiving chip blower air extending to a second valve of said valves, said first valve having a first outlet passage, said



second valve having a second outlet passage, a line channel interconnecting said first and second outlet passages, a supply channel extending from said line channel for communication with a dental apparatus, and a control piston being disposed in the line channel with chip blower air acting on one side and spray air acting on the other side, said piston being movable in the line channel between a first position blocking flow from the second outlet passage and permitting flow from the first outlet passage to the supply channel and a second position blocking flow from the first discharge passage and permitting flow from the second discharge passage to the supply channel so that an application of a charge of chip blower air forces said piston to the second position to permit flow of the chip blower air to the supply channel and an application of a charge of spray air moves the piston to the first position permitting flow of the spray air to the supply channel; and means for sealing the ends of the channels of the supply strip and any of said groups of openings which are free of one of said blocks.

4,136,451

DEVICE FOR MEASURING DISTANCE FOR A SKI

Pierre Briand, Le Brassus, and Remy Berney, Le Sentier, both of Switzerland, assignors to Francois Golay S.A., Le Brassus, Switzerland

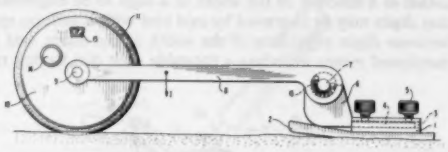
Filed Oct. 4, 1977, Ser. No. 839,366

Claims priority, application Switzerland, May 12, 1977, 5936/77

Int. Cl.[2] G01B *3/12*

U.S. Cl. 33—141 E **3 Claims**

1. In combination with a ski, a device for measuring distance traveled by the ski, said device comprising an arm that extends lengthwise of the ski to the rear of the ski, a wheel mounted for rotation on the rear end of the arm about an axis perpendicular to the length of the ski, an axle parallel to the axis of the wheel, at the front end of the arm, on which the arm is mounted for vertical swinging movement, a counter associated with the wheel for counting revolutions of the wheel and for displaying said revolutions of the wheel as the distance traveled by the ski, a support for said axle at the forward end of the arm, a female bracket secured to the rear end of the ski that receives a male portion of said support, clamping means for releasably



clamping said male portion in said bracket, said wheel being disposed in the track of said ski, and a spring urging said arm downwardly about said axle at the forward end of said arm.

4,136,452

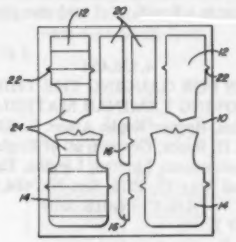
METHOD FOR FABRICATING A CUSTOM FIT GARMENT

Marguerite R. McMillan, Boulder, Colo., assignor to Camp 7, Inc., Longmont, Colo.

Filed Apr. 13, 1977, Ser. No. 787,096

Int. Cl.[2] A41H *3/06*

U.S. Cl. 33—17 R **3 Claims**



1. A method for fabricating a custom fit garment, the steps including:

(a) selecting a length of fabric,

(b) selecting a set of pattern pieces for the desired garment which has a basic nominal size closest to the actual size of the intended wearer,

(c) spacing the pattern pieces in the set on said fabric so that an excess of fabric is provided around the perimeter of each pattern piece,

(d) marking the outline of the spaced pattern pieces on said fabric,

(e) comparing the known dimensions of the nominal sized pattern pieces with the actual corresponding measurements of the intended wearer to determine the alteration differences required for each dimension to custom fit the finished garment to the intended wearer,

(f) altering the outline of the individual pattern pieces on said fabric to correspond to the various dimensional differences determined,

(g) cutting the individual garment pieces from the fabric following the altered pattern outline, and

(h) joining the pieces together to form the custom fit garment.

4,136,453

ENGRAVING MACHINE

Jack W. Levine, Levittown, N.Y., assignor to New Hermes, Incorporated, New York, N.Y.

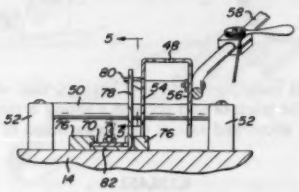
Filed Jul. 28, 1977, Ser. No. 819,793

Int. Cl.[2] B43L *13/10*; B23Q *17/00*

U.S. Cl. 33—21 R **8 Claims**

1. An engraving machine for engraving on curved surfaces comprising a frame, an engraving tool supported by said frame,

means on said frame for supporting an article to be engraved, and means on said frame for automatically causing relative rotary motion between said tool and said article supporting means as a function of the width of a digit to be engraved so that digits may be engraved by said tool with a uniform space between digits regardless of the width of the digits, said last mentioned means including a rotatable digit dial having radially disposed grooves, each groove being aligned with a digit on the dial, said grooves having different lengths as a function of the width of the digit aligned therewith, and said grooves starting at a uniform distance from the axis of rotation of said dial said last named means also including an actuator for rotating said supporting means, means connected to said actuator for engagement with one of said grooves for rotating said supporting means as a function of said one groove.

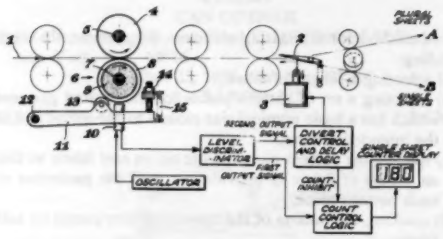


4,136,454

APPARATUS FOR GAUGING THE THICKNESS OF MOVING LAMINAR MATERIAL

Stuart M. Jenkins, Bognor Regis; Albert K. King, Portsmouth, and Raymond D. Reece, Gosport, all of England, assignors to De La Rue Instruments Limited, London, England

Filed May 17, 1976, Ser. No. 686,903
Int. Cl.[2] G01B 5/04
U.S. Cl. 33—147 L **5 Claims**



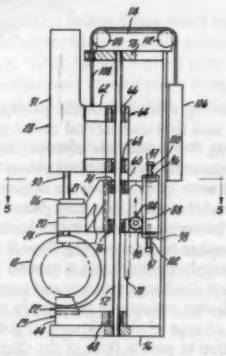
1. Apparatus for recognizing the passage of single sheets and superposed such sheets fed along a flow-line, said apparatus comprising a first roller of rigid material disposed on a first shaft having a fixed axis, a second roller having a rigid ferrous sheet contacting periphery disposed on a second shaft, said first and second rollers defining a nip therebetween, means biasing said second roller periphery toward said first roller so as normally to make rolling contact therewith while being capable of moving away therefrom by the passage of a sheet or sheets through said nip, means for conveying sheets through said nip, an electromagnetic transducer disposed in radially spaced relationship to the ferrous sheet contacting periphery of said second roller and remotely located from said nip, the relative positions of said transducer and said second roller being such that the spacing of said transducer from said second roller reduces and a magnetic coupling effect derived from said ferrous sheet contacting periphery increases proportionally upon the passage of a sheet through said nip, first and second threshold devices, means responsive to movement of said second roller for preventing contact between said transducer and said second roller, and electronic circuit means including a level discriminator coupled with said transducer for detecting the level of current in said transducer as influenced by the position of said ferrous periphery and selectively generating a single-sheet indicative output signal and plural-sheet indicative output signal in accordance with the position of said ferrous periphery.

4,136,455

FLOATING HEAD CHECKING FIXTURE

Paul J. Owsen, Traverse City, Mich., assignor to Century Specialties, Inc., Traverse City, Mich.

Filed Feb. 23, 1977, Ser. No. 771,180
Int. Cl.[2] G01B 7/02, 7/12
U.S. Cl. 33—147 F **36 Claims**

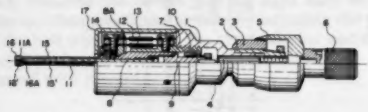


1. A measuring gage comprising: a gage frame; a first gaging finger mounted for movement in said gaging frame; a second gaging finger mounted for movement in said frame and located to define a gaging opening between said first and second gaging fingers as said first and second gaging fingers move toward and away from each other by virtue of said respective movements in said gaging frame; displacement transducer means for generating a signal corresponding to the relative position of said first and second gaging fingers, thereby generating a gaging signal corresponding to the dimension of the workpiece engaged by said first and second gaging fingers; means drivingly interconnecting said first and second gaging fingers to produce a substantially corresponding opposite movement of each of said first and second gaging fingers toward and away from each other upon movement of either of said gaging fingers; biasing means for applying a biasing force to one of said first or second gaging fingers in a direction urging said one of said gaging fingers toward the other of said gaging fingers whereby said means drivingly interconnecting said first and second gaging fingers urges said other of said gaging fingers toward said one of said gaging fingers; control means operatively connected to said means drivingly interconnecting said first and second gaging fingers for selectively moving both of said first and second fingers apart against said biasing force.

4,136,456
HOLE GAUGE

Mineo Yamauchi, and Masao Nakahara, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Mitutoyo Seisakusho, Tokyo, Japan

Filed Dec. 9, 1976, Ser. No. 748,888
Claims priority, application Japan, Dec. 10, 1975, 50-167084[U]
Int. Cl.[2] G01B 5/12, 3/18
U.S. Cl. 33—164 C **7 Claims**



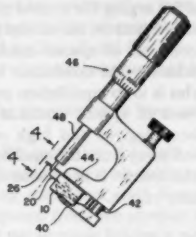
1. A hole gauge comprising
a main supporting body having an opening communicating with an interior space in said body,
a spindle and means for axially moving said spindle forwardly and rearwardly with respect to said opening in said body;
a plurality of elongated support arms projecting axially from the opening in said body, said arms having rearward ends mounted within said body by means mounting said arms and preventing axial movement thereof with respect to said body, and forward ends remote from said body;
contact points fixed to said forward ends of said arms;
a contact point expanding shaft engaging said spindle and mounted to move axially with said spindle, said shaft comprising
a forward portion projecting axially from said body between said arms and having first tapered surface means engaging each of said arms at a first contact location remote from said body for expanding said forward ends of said arms, and
an intermedaite portion having second tapered surface means engaging each of said arms at a second contact location remote from said contact points for expanding said arms;
each of the associated first and second tapered surface means having the same inclination and facing in the same direction so that said forward and rearward ends of said arms are expanded the same radial distance simultaneously, in response to movement of said shaft; and
said mounting means including spring means for each arm supported by said body for urging the associated arm radially toward said contact point expanding shaft.

4,136,457
PIN MICROMETER ADAPTER

Klaus Langer, 1750 Halford Ave., Apt. 106, Santa Clara, Calif. 95051

Filed Mar. 13, 1978, Ser. No. 885,542
Int. Cl.[2] G01B 3/18
U.S. Cl. 33—167 **5 Claims**

1. An adapter for converting an interchangeable anvil micrometer to accept very small diameter anvil pins, said adapter comprising:
a rigid channelled member having a flat internal floor, a flat exterior surface parallel with said floor, and two substantially parallel side walls extending from said floor to provide a generally U-shaped cross-section;
said internal floor having a width to provide a loose fit over the clamping jaw of the interchangeable anvil micrometer;
said exterior surface having a length suitable for reaching the longitudinal center line of the micrometer spindle;
a V-groove in the longitudinal center of said exterior surface for clamping a pin between said exterior surface and the stationary reference jaw of said micrometer; and

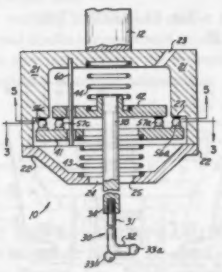


means in at least one side wall of said channel member for retaining said member in said micrometer clamping jaw.

4,136,458
BI-AXIAL PROBE

Frederick K. Bell, Centerville; Jerome E. Deis, Kettering, and Paul E. Allen, Springfield, all of Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed Oct. 1, 1976, Ser. No. 728,573
Int. Cl.[2] G01B 7/00
U.S. Cl. 33—174 L **18 Claims**



1. In combination with a probe of the type having a housing, a stylus extending outwardly in an axial direction from the housing and having a position of equilibrium before any force external from the probe acts thereon, means for movably mounting said stylus to the housing to allow the stylus to displace to a first position from the equilibrium position, in response to a first force by an object on the stylus in any direction chosen from a radial and an axial direction toward the housing, a movable plate coupled to the stylus and carrying a conductor having spaced insulator regions along conductor, a set of contacts fixed to the housing and disposed to bridge and spaced insulator regions when the movable plate engages the contacts, and means for urging the plate toward the contacts fixed to the housing, the improvement comprising:
a stylus portion carried by the stylus and extending transversely to the axis of the stylus;
means for movably mounting the stylus to the housing to allow the stylus to displace from the equilibrium position in response to a second force by the object on the stylus portion directed axially away from the housing to a second position below said equilibrium position; and
means responsive to said second force for generating an electrical signal which is a function of the displacement of the stylus as a result of said second force, said generating means including:
a second set of spaced insulator regions disposed on said conductor;
a second plate disposed within the housing and having a

second set of contact fixed thereto and disposed to bridge the second set of spaced insulator regions when the stylus is in the equilibrium position; and

a second means for urging the second plate toward the first plate with the contacts on the second plate in engagement with the second set of spaced insulator regions in the conductor, whereby the conductor has a low-resistance when the stylus is in its equilibrium position and said first and second sets of spaced contacts are seated on the spaced insulator regions and high resistance when the stylus is moved away from the equilibrium position and at least one of the contact is not seated in the corresponding spaced insulator region.

4,136,459

PARALLELIZING GAUGE IN A WEDGE ERROR CORRECTION HEAD

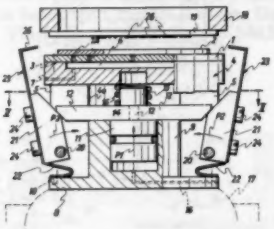
Winfried Suss, Unterhaching, Fed. Rep. of Germany, assignor to Karl Suss KG, Garching, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 761,431

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1976, 2607607

Int. Cl.[2] G03B *27/02*

U.S. Cl. 33—180 R **4 Claims**



1. A parallelizing gauge for maintaining a predetermined parallel spacing between a lignt exposure mask and a substrate plate comprising, in combination:

(a) means for holding a flat light exposing mask in a predetermined plane;

(b) a substrate supporting member having a surface disposed in a generally parallel, spaced apart relationship with respect to said predetermined plane;

(c) positioning means coupled to said substrate supporting member for selectively moving said substrate supporting means toward and away from said light exposing mask; and

(d) at least three spacer members operatively coupled to said substrate supporting member and movable relative thereto, means for automatically moving said spacer members radially inwardly into the space between said substrate supporting member and light exposing mask at different points around the periphery of said substrate supporting member in response to the movement of said substrate supporting member towards said light exposing mask, the radial motion of said spacer members being small with respect to the dimensions of the substrate plate, and as said substrate supporting member is withdrawn from said light exposing mask, said means for moving said spacer member further causing said members to be retracted radially outwardly from the space therebetween.

4,136,460

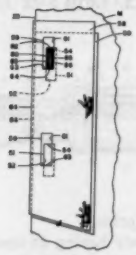
ADJUSTABLE BUTTONHOLE SEWING GUIDE

Della E. Cornwall, 5065 S. Gurene Dr., Salt Lake City, Utah 84117

Filed Mar. 21, 1977, Ser. No. 779,283

Int. Cl.[2] A41H *25/00*

U.S. Cl. 33—190 **11 Claims**



1. A buttonhole sewing guide for sewing buttonholes in fabric, comprising:

a thin, flexible template having a lateral edge and a plurality of generally rectangular holes therethrough of a size larger than the desired buttonhole for placement on the fabric where the buttonhole is to be sewn, said holes having a common axis parallel to said lateral edge and each having a vertical length along said common axis and a horizontal length along a respective individual axis perpendicular to said common axis, and

size adjustment means associated with said template selectably actuable for reducing the effective size of holes in said vertical and horizontal lengths both separately and simultaneously to correspond with the desired size of the buttonhole stitching to be sewn, the effective size of each of said holes being adjusted in a common manner.

4,136,461

SIGHTING DEVICE FOR BOW

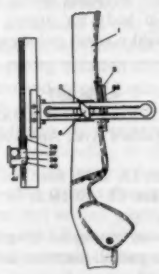
Max Gasser, Berneck, Switzerland, assignor to Max Gasser AGF Produktion, Berneck, Switzerland

Filed Oct. 17, 1977, Ser. No. 842,876

Claims priority, application France, Jun. 29, 1977, 77 20546

Int. Cl.[2] F41G *1/46*

U.S. Cl. 33—265 **10 Claims**



1. A sighting device for attachment to a bow, comprising:

a sight for aiming arrows;

a mount for supporting the sight;

a worm gear rotatably attached to the mount;

a rack having teeth and means for slidably retaining the mount thereon with the worm gear meshed with the teeth whereby rotation of the worm gear advances the mount along the rack;

a bar having a slot extending therein wherein the slot has a

periphery with a plurality of similarly formed spaced depressions;

means for mounting the rack on the bar so as to extend generally normal to the bar;

a threaded bolt passing through the slot in the bar and having an enlarged portion complementing individually the depressions of the slot; and

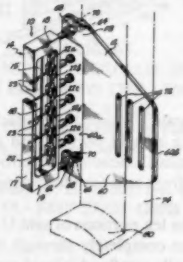
a cradle for attachment to a bow, said cradle having a threaded opening therein in which the bolt is screwed to hold the bar in selected positions with respect to the cradle; whereby when the cradle is attached to a bow, the rack retaining the mount for the sight may be spaced selected distances from the bow by adjusting the position of the bolt with respect to the slot in the bar and the sight may be advanced along the rack to adjust the altitude thereof with respect to the bow.

4,136,462

ADJUSTABLE CROSSHAIR SIGHT FOR ARCHERY BOW

Kenneth D. Topel, 11209 Shaw Rd. E., Puyallup, Wash. 98371

Filed Dec. 12, 1977, Ser. No. 859,432
Int. Cl.[2] F41G *1/46*
U.S. Cl. 33—265 **8 Claims**



1. An archery sight for use with a bow, said archery sight comprising:

a mounting plate, said mounting plate having opposing parallel surfaces;

a crosshair frame, said crosshair frame having a longitudinal dimension and a transverse dimension, said crosshair frame including a first and a second elongate side wall lying along said longitudinal dimension of said frame in generally parallel spaced relation to one another, each said side wall having a first and second end, said first side wall having a slot formed therethrough along its elongate dimension, an elongate top wall attached to said first ends of said side walls and an elongate bottom wall attached to said second ends of said side walls, said side walls and said top wall and said bottom wall in assembly defining an aperture;

means for mounting said crosshair frame on said mounting plate such that a plane defined by the transverse and longitudinal dimensions of said crosshair frame is substantially normal to one surface of said mounting plate;

a plurality of first wires mounted in said crosshair frame substantially contained within said aperture and extending across said aperture in substantially parallel spaced relation to each other and substantially parallel to the transverse dimension of said crosshair frame;

a second wire mounted in said crosshair frame orthogonal to and intersecting said plurality of first wires, said second wire lying in the plane defined by said longitudinal and transverse dimensions of said crosshair frame;

clamping means attached to a first end of each of said first wires adjacent said first side wall for releasably clamping said first side wall to attach said first wires to said frame, said clamping means including a T-nut attached to said first end of said first wire, said T-nut having a crossbar portion abutting a first surface of said first side wall and a shank portion extending into said slot, a threaded shaft having a first end and a second end, said first end threadably engaging said T-nut, a bushing affixed to the second end of said threaded shaft, means associated with said bushing for preventing said bushing from passing through said slot, said means being interposed between said bushing and a second surface of said first side wall so that said first side wall is clamped between said bushing and said T-nut.

6. An archery sight for use with a bow, said archery sight comprising:

a mounting plate for mounting the sight to the bow, said mounting plate haveing a first tab portion and a second tab portion extending therefrom, said first and second tab portions being spaced from one another, and each of said first and second tab portions having a mounting aperture formed therethrough;

a crosshair frame spaced from said mounting plate, said crosshair frame having a first shaft and a second shaft extending therefrom, said first and second shafts being spaced from one another, said first shaft engaging and extending through said mounting aperture in said first tab portion and said second shaft engaging and extending through said mounting aperture in said second tab portion;

a plurality of first wires mounted on said crosshair frame in substantially parallel spaced relation to each other to provide range markers;

a second wire mounted on said crosshair frame orthogonal to and intersecting said plurality of first wires to provide a windage marker; and

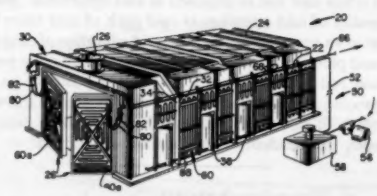
first means for varying the amount of tlie extension of said first and second shafts through said mounting apertures so as to vary the spacing between the mounting plate and the frame to provide a windage adjustment.

4,136,463

RADIANT HEAT PAINT SPRAY CHAMBER

Damon P. Nolan; Damon P. Nolan, II, and Kevin T. Nolan, all of 888 ElCielito, Denton, Tex. 76201, assignors to Damon P. Nolan; Damon P. Nolan, II and Kevin T. Nolan, all of Denton, Tex.

Filed Dec. 6, 1976, Ser. No. 742,092
Int. Cl.[2] F26B *3/32*
U.S. Cl. 34—39 **12 Claims**



1. A paint chamber for applying radiant heat to an object to prepare the object for painting comprising:

a structure for housing the object to be painted;

tubing fixed in surface contact with the outside of at least one wall of said structure;

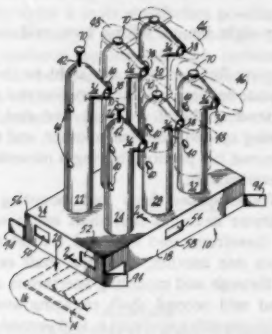
means for circulating a heated fluid through said tubing to thereby heat the wall of said structure in which said tubing is in contact; and

means for insulating the outside of the wall of said structure in which said tubing is in contact to attach said tubing to said wall and to direct radiant heat into said structure whereby the object to be painted is heated.

4,136,464
BOOT DRYING APPARATUS

Alexander Hay, 56 Maywood Park, Scarborough, Canada (M1K 2G8)

Filed Oct. 12, 1977, Ser. No. 841,309
Int. Cl.[2] F26B *25/00*
U.S. Cl. 34—104 8 Claims



1. A boot drying apparatus comprising a plenum chamber, said plenum chamber having an open mouth portion, said plenum chamber having walls adjacent said open mouth portion thereof, said walls having a plurality of openings therein communicating to the interior of said plenum chamber, said open mouth portion of said plenum chamber located at a lower surface thereof, said plenum chamber having an upper surface, said walls being located intermediate said open mouth portion and said upper surface, said upper surface having a plurality of holes therein, a plurality of tubes, said plurality of tubes and said plurality of holes and said plurality of openings being equal in number, said plurality of tubes fixedly secured to said uppermost surface, each of said tubes having an opening at one end, said opening at said one end interlocated surrounding said holes in said upper surface, each of said tubes extending upwardly from said surface and having the longitudinal axes thereof being disposed substantially parallel to one another, each of said tubes having a plurality of openings in the walls thereof, said each of said tubes having a rod extending along the length of said tubes, means to bias the uppermost end of said rod upwardly away from said plenum chamber in an uppermost position, said plurality of openings in said each of said tubes being disposed in a closed position and said plurality of openings in said plenum chamber being disposed in a closed position when said rod is disposed in said uppermost position, said plurality of said openings in said each of said tubes being disposed in an open position when said plurality of said openings in said plenum chamber being disposed in an open position when said rod is disposed in a downward position, an additional opening in the surface of said tubes located in the uppermost region of said tubes, said additional opening being disposed open independent of the location of said rod.

4,136,465
TOBACCO BULK CURING CONTAINER SECTIONS AND COMPOSITE BARN CONSTRUCTION FORMED THEREBY

Robert W. Wilson, Charlotte, N.C., assignor to Powell Manufacturing Company, Inc., Bennettsville, S.C.

Continuation-in-part of Ser. No. 649,674, Jan. 16, 1976, abandoned. This application Jan. 13, 1977, Ser. No. 758,921
Int. Cl.[2] A24B *1/06*
U.S. Cl. 34—210 37 Claims

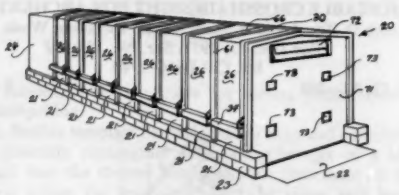
33. A container for receiving tobacco leaves while disposed in a horizontal loading position and for supporting the leaves for curing while disposed in a vertical curing position, said container when in said loading position comprising

a horizontally extending bottom structure,

a pair of side walls extending upwardly from said bottom structure in parallel relation with respect to one another,

said bottom structure and said side walls defining curing space of a size comparable to a transverse section of a curing barn above said bottom structure and between said side walls which is open at the upper end thereof so that tobacco leaves can be filled downwardly in random fashion into supported relation to said bottom structure between said side walls and uniformly loaded into said curing space,

top closure means for securement between said side walls across the open upper end of said curing space after the tobacco leaves have been filled therein to provide with said bottom structure and said side walls peripheral confinement for the loaded tobacco leaves, and



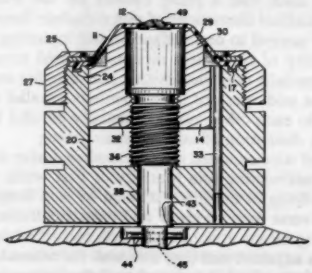
a plurality of separate U-shaped tines, each of said U-shaped tines comprising a bight portion and a pair of generally parallel leg portions extending therefrom of a length sufficient to extend from said top closure means to said bottom structure,

the free ends of the leg portions of said U-shaped tines being shaped to pierce completely through the loaded tobacco leaves peripherally confined in said curing space so as to be positioned adjacent the bottom structure when the associated bight portion is positioned adjacent said top closure means whereby when said container is moved from said loading position into said curing position said U-shaped tines are positioned to be supported and to provide interior support for the peripherally confined tobacco leaves in the curing space during the curing operation.

4,136,466
ARTIFICIAL INTRAOCULAR LENS TRAINING DEVICE

Richard J. Wrue, Greece, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Nov. 21, 1977, Ser. No. 853,151
Int. Cl.[2] G09B *23/34*
U.S. Cl. 35—17 9 Claims



1. An apparatus for providing an adjustable aperture, comprising:

a flexible diaphragm having a circular aperture therethrough;

cylindrical diaphragm mounting means having said diaphragm peripherally secured thereto for supporting said flexible diaphragm;

a cylindrical diaphragm control member disposed for movement within said cylindrical diaphragm mounting means, said diaphragm control member effecting stretching of said diaphragm and enlargement of said aperture upon movement of said control member toward said diaphragm and permitting contraction of said diaphragm upon movement of said control member in the opposite direction; and

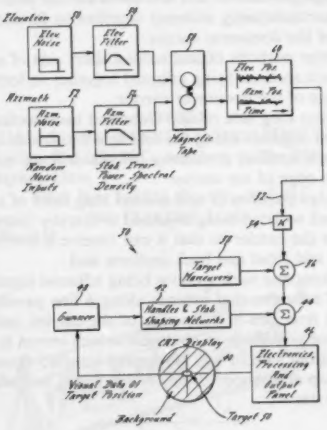
means for selectively effecting movement of said diaphragm control member with respect to said diaphragm mounting means either towards said diaphragm or in the opposite direction to vary the size of said diaphragm aperture.

4,136,467

MEANS AND METHOD FOR IMPARTING STABILIZATION ERROR TO THE LINE OF SIGHT OF A SIMULATOR

John D. O'Rourke, Utica, and Stuart W. Flockencier, Mt. Clemens, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Jun. 20, 1977, Ser. No. 808,210
Int. Cl.[2] F41F 27/00; G09B 9/00
U.S. Cl. 35—25 **12 Claims**



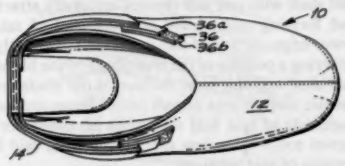
1. For a simulator which simulates the view of a target, provides for movement of the target in the field of view, and has a line of sight which the user of the simulator must place on the target, the method of more realistically simulating in the simulator a system having a stabilized line of sight by introducing the stabilization error which the stabilized line of sight in the system being simulated experiences comprising: determining the stabilization error in the line of sight of the system being simulated in response to disturbances; making a real time record of the stabilization error; and when the simulator is in use, playing the record and imparting the real time stabilization error contained therein to the line of sight of the simulator while also imparting target maneuvers to the target of the simulator.

4,136,468

FOOTWEAR

Dorothy G. Munschy, 1512 Locust Ravine, Bakersfield, Calif. 93306

Filed Feb. 21, 1978, Ser. No. 879,096
Int. Cl.[2] A43B 3/26
U.S. Cl. 36—97 **7 Claims**



1. Improved footwear comprising:

A. a flexible cover component for a human foot including a sole portion characterized by forward, central and rearward sections arranged in contiguous, coplanar relation, an upper portion integrally related with the sole portion including a toe section disposed in spaced relation with the plane of the sole portion, a pair of side sections comprising a pair of foldable side tabs extended rearwardly from said toe section, and a heel portion including a foldable heel tab integrally related to the rearward section of the sole portion and projected upwardly therefrom;

B. a flexible binder component for securing the cover component about a human foot comprising a strap having a midsection united with the heel tab in a spaced relation with the rearward section of the sole portion, and a pair of end sections positionable into overlapping relation with the toe section of the upper portion; and

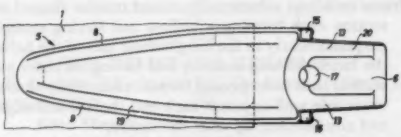
C. fastening means for releasably connecting the end portions of the binder component to the toe section of the upper portion, including at least one-half of a Velcro fastener affixed to each end section of the strap of the binder component.

4,136,469

SHOVEL TOOTH

Hans-Rudolf Zepf, Hirsackerstrasse 30, Horgen, Switzerland

Continuation of Ser. No. 656,793, Feb. 10, 1976, abandoned. This application Jun. 10, 1977, Ser. No. 805,473
Claims priority, application Switzerland, Feb. 21, 1975, 2195/75
Int. Cl.[2] E02F 9/28
U.S. Cl. 37—141 T **7 Claims**



1. A shovel tooth for use in combination with a construction machine of the type having a shovel blade having an inner surface and a front edge comprising:

a unitary tooth holder including

a rear portion attachable to the inner surface of the blade and formed as a half shell having a generally U-shaped cross section, said half shell defining a recess opening toward the blade inner surface when attached thereto and having closed forward and rearward ends, said U-shaped cross section having a bight and two legs extending from each side of said bight, said legs and said rearward end termi-

nating in a continuous edge, said continuous edge being rigidly attachable to only the inner surface of the blade so that said half shell and the inner surface of the blade define a cavity therebetween when attached, the cross-sectional area of said recess taken in planes parallel to the inner surface of the blade and bounded by said legs and ends constantly increasing from said bight to said continuous edge;

a transverse web extending across the forward end of said half shell with one side thereof integrally attached thereto and forming said closed forward end of said recess, a lower edge portion of said web extending partly along and covering a portion of the front edge of the blade when said half shell and the inner surface of the blade are attached;

the entire surface area of said recess being exposed from the underside of said half shell with no other portion of the shovel tooth extending rearwardly from said lower edge portion of said web;

a forward projecting portion integrally connected to the opposite side of said web from said half shell, said forward projecting portion extending away from the front edge when said half whell and the inner surface of the blade are attached; and

a tooth cap detachably mounted on said forward projecting portion, said cap having an interior cavity shaped to receive and substantially mate with said forward projecting portion.

4,136,470

QUICK CHANGE PICTURE FRAME

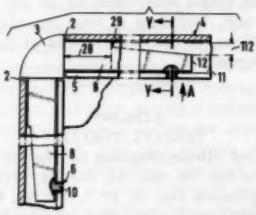
Benno Barz, Gienanthstrasse 10, D-6750 Kaiserslautern, Fed. Rep. of Germany

Filed Nov. 8, 1976, Ser. No. 739,738

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1975, 2551302

Int. Cl.[2] G09F *1/12*

U.S. Cl. 40—152 **11 Claims**



1. A quick change frame for pictures comprising frame moldings and corner joints for detachably fixing the frame moldings together, comprising

frame moldings substantially closed tubular shaped in cross-section each forming a hollow rail having straight ends perpendicularly to the longitudinal axis of the hollow rail, the latter defining a cavity and having an inner side wall with at least one opening formed completely through said inner side wall adjacent each end thereof and adjacent to and communicating with the cavity,

corner joints constituting angle pieces each including a central portion exposed between said straight ends of adjacent of said hollow rails, respectively and two angle arms attached to said central portion, each of said arms having a portion adjacent said central portion corresponding complementary in shape and size to the cross-section of the cavity of said hollow rail of said frame moldings, each of said arms includes at least one male detent part projecting out from said arms and releaseably snappingly inserted from said cavity of a respective of said hollow rail into said at least one opening in said inner side wall of said respective hollow rail,

said two arms form an angle less than 90°.

4,136,471

DOCUMENT CARRIER

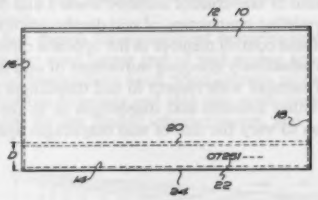
Alan Austin, Leeds, England, assignor to Alf Cooke Bag Co. Ltd., Leeds, England

Filed Aug. 19, 1976, Ser. No. 715,761

Claims priority, application United Kingdom, Aug. 18, 1975, 34338/75

Int. Cl.[2] G09F *1/10*

U.S. Cl. 40—159 **2 Claims**



1. A document carrier comprising a single folded over sheet of material said folded over sheet including a front section and a back section that are parallel to each other

said front section having the configuration of a rectangle that includes

a first short side

a second short side

a first long side

a second long side

said back section having the configuration of a rectangle that includes

a first short side

a second short side

a first long side

a second long side

(a) the edge portions of said first short sides of said front and back sections being adhered together to form a leading edge of the document carrier.

(b) the edge portions of said second short side of said front and back sections being adhered together to form a trailing edge of the document carrier,

(c) said first long side of said front and back sections being adhered together along the fold line that forms said front and back sections to thereby provide a sharp and strong bottom edge of the carrier.

(d) the edge portions of said second long sides of said front and back sections being unjoined to thereby form an open top for the carrier so that it can receive a document between said front and back sections, and

(e) said front and back sections being adhered together by a line of adhesive that extends along a line parallel to but spaced fron said bottom edge of the carrier, said line of adhesive providing an abutment which serves to support the bottom side of any document inserted through said open top at a spaced distance above said bottom edge of the carrier.

4,136,472

READOUT CASSETTE

Bernd Delvo, No. 35, Bürgermeister-Lauck-Strasse, 6093 Flörsheim am Main, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 775,211

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610117

Int. Cl.[2] G09F *11/29*

U.S. Cl. 40—471 **5 Claims**

1. A readout cassette comprising:

a) a casing having front and back sides and comprising first and second chambers spaced from each other and first and second walls spaced and substantially parallel to each other and extending between said chambers, at least one of said walls having a viewing window therein;

b) first and second reels each having a core and mounted in said first and second chambers respectively for rotation about respective axes;
c) means extending from said casing for rotating at least one of said reels; and
d) a thin elongated web having printing on at least one side thereof and extending between the cores of said reels, said web being coiled in one rotary direction about the core of one of said reels and being coiled in the opposite rotary direction about the core of the other of said reels;
e) said first and second walls extending from said first chamber tangentially on the front side of the axis of said first

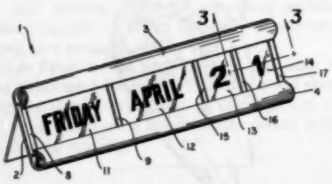
reel to said second chamber tangentially on the back side of the axis of said second reel such that the axis of said first reel is adjacent the back side of the plane of said first wall and is closer to the plane of said first wall than the plane of said second wall and the axis of said second reel is adjacent the front side of the plane of said second wall and is closer to the plane of said second wall than the plane of said first wall;
f) whereby said web extends in a straight line from said first reel and between said walls to said second reel during the period that said web is withdrawn from one of said reels and taken up on the other of said reels during simultaneous rotation of said reels in opposite directions.

4,136,473

MANUALLY ADJUSTABLE INDICATING DEVICE

Stanley S. Coe, Raleigh, N.C., assignor to The Mead Corporation, Dayton, Ohio

Filed Jun. 1, 1977, Ser. No. 802,441
Int. Cl.[2] G09F *11/18*
U.S. Cl. 40—518 **8 Claims**



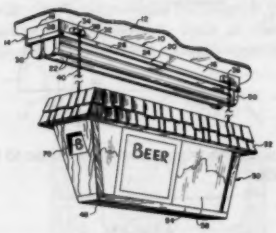
1. A manually adjustable indicating device comprising a housing structure having a substantially flat base plate and a pair of storage cavities secured to opposite side edges of said base plate, a support plate slidably mounted in said housing structure in parallel relation to said flat base plate and having at least one pair of horizontally spaced transversely disposed ribs to the outer edges of which a pair of flanges are secured, and a self coiling tape having its coiled ends disposed respectively in said storage cavities and having an intermediate portion arranged in flat face contacting relation to said base plate and with its side edges underneath said flanges, said tape having visually observable indicia thereon.

4,136,474

ILLUMINATED OVERHEAD ADVERTISING DISPLAY

Paul Belokin, Jr., Rte. #4, Hayward, Wis. 54843

Filed May 11, 1977, Ser. No. 795,796
Int. Cl.[2] G09F *13/04*
U.S. Cl. 40—559 **1 Claim**



1. An overhead sign for disposition in spaced apart relationship below and for illumination from an elongated horizontally disposed light source which is simultaneously employed to illuminate a space below said overhead sign, said overhead sign comprising:
a translucent relatively resilient lower member comprising a pair of spaced apart side walls sloped inwardly and downwardly toward each other and a pair of spaced apart end walls;
each wall comprising an inner light-receiving surface and an outer light-emitting surface and at least some of said walls comprising an outwardly extending flange near the top thereof;
an opaque upper member to which said lower member is detachably connected and comprising a pair of spaced apart side walls and a pair of spaced apart end walls;
each wall of said upper member comprising an inner surface, an outer surface, and a lower surface;
a surface on at least some of said walls of said upper member having a groove releasably receiving the flange of the associated wall of said lower members to detachably connect said lower portion and said upper portion of said sign;
said outer surface sloping inwardly and upwardly relative to its associated inner surface, and said lower surface extending transversely away from said light-emitting surface of the associated lower wall, whereby said upper member permits direct illumination of said light-receiving surface from said light source but prevents direct illumination of said light-emitting surface from said light source, and permits illumination of said space below said sign from said light source;
and means on said sign for suspending said sign below said light source.

4,136,475

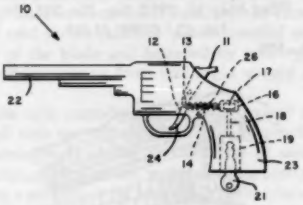
SAFETY DEVICE FOR FIREARMS

Edward E. Centille, 2 Yorktown Rd., Candlewood Village, De-Monte, Ind. 46310

Filed May 26, 1977, Ser. No. 800,639
Int. Cl.[2] F41C *17/00*
U.S. Cl. 42—1 LP **2 Claims**

1. A locking mechanism for firearms comprising a firing mechanism, an opening extending into the firearm and in communication with a seat of a trigger of the firing mechanism, a key operable lock installed in the opening, the lock having a key plug in rotatable communication with a rack and pinion gear linkage activating member, a locking pin mounted for movement in unison with the rack of the rack and pinion gear linkage and in slidable engagement with the trigger seat, the pinion gear mounted for rotation on a shaft which is in rotatable communication with the key plug, the locking pin in slidable engagement with a recess in the trigger seat, a spring

spiraled about the locking pin and in operative relation to both the trigger seat and the rack, the locking pin selectively locking and unlocking the trigger seat in response to the operation of the key lock.

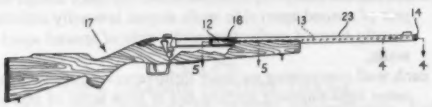


4,136,476

SAFETY DEVICE FOR PORTABLE FIREARMS

George Hetrick, Walnut Creek, Calif., assignor to Richard L. Gorman, Walnut Creek, Calif., a part interest

Filed Sep. 19, 1977, Ser. No. 834,713
Int. Cl.[2] F41C *27/00*
U.S. Cl. 42—1 LP **8 Claims**



1. A safety device for a portable firearm having a firing chamber and barrel, comprising:

a metallic cartridge plug insertable into the firing chamber of the firearm, the plug being rotatable within the chamber about its longitudinal axis and having threaded means,

a telescoping rod insertable into and through the barrel of the firearm and into threading relationship with the cartridge plug, and

a cap affixed to the outer end of the telescoping rod, the cap having a diameter substantially in excess of the bore diameter of the firearm.

4,136,477

FISHHOOK DEVICE

Paul R. Hines, 3721 Williamsburg, Boise, Id. 83706; Edward A. Shelly, 3010 S. Willis, Abilene, Tex. 79605, and Paul R. Hines, 1237 Anson Ave., Abilene, Tex. 79601

Filed May 2, 1977, Ser. No. 793,198
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—15 **6 Claims**

1. Apparatus for setting a hook on application of a sufficient force to said hook, the apparatus being attached to the end of a first length of line, the apparatus comprising:

an elongated body member having a first end and a second end, the first length of the line being attached generally at the first end of said body member;

a pivot arm pivotally mounted to said body member at the second end thereof and disposed to pivot about a pivot axis;

tension spring means mounted on said body member, the spring means being elastically deformable from a fixed point of attachment near the first end of the body member, a lower portion of the spring means being releasably engageable with the pivot arm when said spring means is in its deformed, tensioned state, the longitudinal axis of the pivot arm being held at an angle to the longitudinal axis of the body member by the pivot arm engaging the spring means at a position laterally spaced of the position of the pivot axis on the body;

a second length of line having one end thereof connected to said lower portion of said tension spring means and the opposite end connected to said hook;

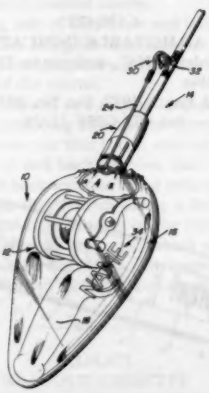
engagement means slidably connecting said second length of line to said pivot arm at a position spaced from the pivot axis along the pivot arm such that a force exerted on said second line will produce a torque on said pivot arm causing the pivot arm to rotate toward the body second end thereby bringing the lower portion of the spring means into a position laterally spaced of the position of the pivot axis on the opposite side of the body from its initial position, thereby releasing the spring means from engagement with the pivot arm, the spring means returning toward its undeformed state to displace the hook substantially toward the body member.

4,136,478

FISHING POLE AND REEL HOLDING BAG

Charles J. Wycosky, 166 Pasadena Ave., Elyria, Ohio 44035

Filed Jan. 26, 1978, Ser. No. 872,389
Int. Cl.[2] A01K *97/08*
U.S. Cl. 43—26 **6 Claims**



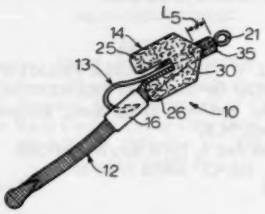
4. In combination with a fishing pole having a handle and a fishing line holding reel mounted on the handle, a cover comprising, in combination:

(a) a receptacle arrangeable around the handle of the fishing pole and covering the reel mounted on the handle; and

(b) fastener means provided on the receptacle for retaining the receptacle on the handle of the fishing pole, the receptacle has an opening arranged for insertion of the fishing rod handle into the receptacle, the fastener means being disposed at the opening for closing the receptacle against the fishing pole, the fastener means including, in combination:

(1) a flexible element slidably mounted on the receptacle about the opening of the receptacle; and
(2) connector means attached to the element and arranged engaging the fishing pole for closing the opening of the receptacle and holding the receptacle on the pole.

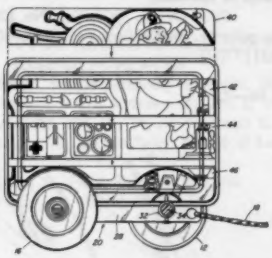
4,136,479
FISHING LURE
Lewis Pierceall, Rte. 2, Lot 15, Chapel Hill, N.C. 27514
Filed Nov. 16, 1977, Ser. No. 852,096
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.22 **1 Claim**



1. A fishing lure, comprising:
a. a flexible body member in the nature of an elongated flexible simulated worm having defined head and tail extremities;
b. a fishhook member having an eye formed at the leading end, a central rod-like shank and at the trailing end a curved hook having a forwardly-directed barb, said flexible body member being mounted on said fishhook member by means of a minor leading portion of said fishhook shank extending through and being confined within a portion of the body of said flexible body member between said eye and a point of exit from said flexible body member rearwardly thereof with said eye residing proximate said head extremity and said curved hook extending outwardly from said flexible body member and said hook barb being directed toward an intermediate portion of said body member;
c. a vane structure including a pair of oppositely-positioned, trailing, bendable, vane portions extending outwardlly from said shank and an integral leading and pointed vane portion forming an extension of said trailing vane portions and means securing said leading vane portion to an intermediate portion of said shank forward of said curved hook, said leading vane portion residing in a plane substantially perpendicular to the plane of said curved hook and said trailing portions providing adjustable guide means designed to affect the path of movement of said fishing lure through water; and
d. surface finish means providing on the inner side of said vane structure adjacent said flexible body member a substantially shiny surface and on the opposite outer side of said vane structure a substantially white, soft, irregular, non-flaking coating.

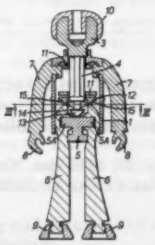
4,136,480
PUZZLE PULL TOY
Norman Fabricant, Rego Park, N.Y., and Matthew A. Moustakas, Mercerville, N.J., assignors to CBS Inc., New York, N.Y.
Filed Mar. 10, 1977, Ser. No. 776,159
Int. Cl.[2] A63H *33/06*
U.S. Cl. 46—17 **5 Claims**

1. A movable puzzle comprising:
at least one set of puzzle pieces each of which consists of a plurality of elongated strips of planar configuration each having length and width dimensions substantially greater than its thickness and having a pictorial representation on at least one of its two flat surfaces which together form a complete pictorial representation on at least one planar face when juxtaposed in a planar configuration edgewise along their length dimension in correct order and with correct longitudinal orientation, and
means for mounting said puzzle pieces in upstanding orientation so as to permit movement of the assembled puzzle pieces, said means including
a vertically oriented generally rectangular frame having a vertically oriented pocket, open at the top, formed therein, said frame having a length approximately equal



to the length of said puzzle pieces and a height dimension approximately equal to the overall width of the juxtaposed puzzle pieces, said frame being operative to provide upright support of puzzle pieces inserted therein through the open top of said pocket, and
wheels supporting said frame permitting relative movement of said frame with respect to a surface,
said mounting means being configured in a design which together with said complete pictorial representation forms a composite representation of a wheeled vehicle.

4,136,481
TOY FIGURES
Bryan F. Nicholls, Northampton, England, assignor to The Mettoy Company Limited, Northampton, England
Filed Jan. 27, 1977, Ser. No. 763,232
Claims priority, application United Kingdom, Sep. 11, 1976, 37730/76; Oct. 28, 1976, 44927/76
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—22 **7 Claims**



7. A toy figure comprising an elongate body having a neck opening at its upper end, a transverse resilient diaphragm intermediate its upper and lower ends, and a tubular portion beneath the diaphragm open from below, a leg assembly comprising a centre fitting and two legs pivotally mounted on said centre fitting, said leg assembly presenting a bulbous, generally hemispherical upper end portion received in said tubular portion of said body, an elongate stem extending rotatably through said neck opening and through an opening in said diaphragm, said stem having an upper end carrying a head and having a lower end disposed adjacent said centre fitting and cooperating therewith to hinder removal of said leg assembly from said body and journal means operative between said leg

assembly and said body to permit rotation of said leg assembly relative to said body about a longitudinal axis of said stem, said diaphragm bearing downwardly on said leg assembly, whereby to take up play between said body, head and leg assembly in a direction longitudinally of said stem.

4,136,482

MATING PLATE AND AXLE ELEMENT, WITH UNDERCUT CONNECTOR

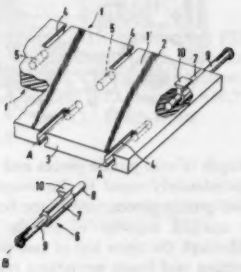
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3 (Tumlingen), Fed. Rep. of Germany

Filed Oct. 5, 1977, Ser. No. 839,589

Claims priority, application Fed. Rep. of Germany, Oct. 6, 1976, 7631177[U]

Int. Cl.² A63H *33/08*

U.S. Cl. 46—23 **16 Claims**



1. In an assembly kit, a combination comprising a plate element having two faces spaced from one another in one direction and two side edges spaced from one another in another direction, said plate element having an undercut groove extending from one of said side edges and open at at least one of said faces, and a bore communicating with said undercut groove; and an axle element having a pin-shaped portion insertable into said bore of said plate element, a holding portion connected with said pin-shaped portion and insertable into said groove of said plate element, said holding portion having a non-circular cross-section mating with the cross section of said groove and being provided with a projecting connecting means for connecting said holding portion with another structural element of the kit, and a shaft portion connected with said holding portion.

4,136,483

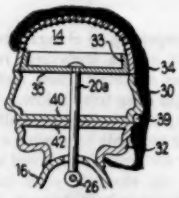
DOLL WITH CHANGEABLE FACIAL FEATURES

Judy Shackelford, Los Angeles, Calif., and Rouben T. Terzian, Chicago, Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 27, 1976, Ser. No. 754,260

Int. Cl.² A63H *13/00*

U.S. Cl. 46—135 R **2 Claims**



1. A figurine having changeable facial features, comprising: means defining a base of the figurine, and means defining a head of the figurine having an upper head portion including at least a part of the top of a face and simulated hair extending downwardly at the rear thereof, a lower head portion including changeable facial features oriented back-to-back and means for mounting said lower head portion for rotation about a generally vertical axis, whereby, when said lower head portion is rotated on its vertical axis relative to said base, the frontal facial features of said figurine are changed and the opposing facial features are hidden behind the simulated hair at the rear of the head, wherein said lower head portion includes a depending neck, and said means for mounting includes said neck having means defining a socket on the lower end thereof, and a complementary ball formed on the base for engagement with said socket to provide forward and rearward pivotal movement of the head relative to the base.

4,136,484

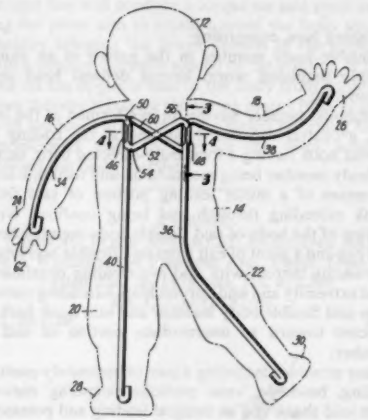
STUFFED DOLL WITH BENDABLE FRAMEWORK AND METHOD OF MAKING FRAMEWORK

D. David Abrams, Kowloon, Hong Kong, assignor to Mego Corp., New York, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,528

Int. Cl.² A63H *3/02, 3/04*

U.S. Cl. 46—160 **12 Claims**



1. A stuffed bendable doll having a bendable linear framework, said doll including a pair of arms and a pair of legs connected to a torso, said framework comprising:

a pair of flexible wires, each said wire coated with an annular layer of flexible reslient plastic, one of said wires extending substantially centrally and longitudinally through each limb of said doll, each said wire having a first portion extending from one of said arms, a second portion extending from one of said legs and a junction connecting said first and second portions, each said junction comprising a first section and a second section, each said first section depending substantially perpendicularly from the inner end of the associated first portion to one end of the associated second section, each said second section extending laterally at an acute angle relative to it's associated first section and further extending substantially parallel to said first section from said one end to another end which is joined to the inner end of the respective second portion, said two wires being joined to each other at said junctions.

10. A method of manufacturing a framework for a stuffed bendable doll including the steps of:

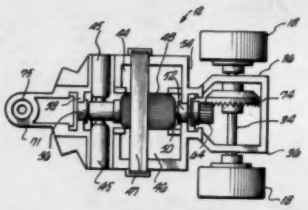
1. extruding flexible wire with deposition of an outer annular resilient plastic coating.
2. cutting said wire into predetermined lengths.
3. bending a pair of said lengths of wire to substantially a right angular bend at a first predetermined distance from one end of each of said wires,

4. bending said pair of wires a second predetermined distance from their respective right angular bends to substantially equal acute angular bends,
5. bending said pair of wires a third predetermined distance from their respective acute angular bends so that the remaining portion of said wire lengths are substantially parallel to the portions formed by step 3,
6. inverting one of said pair of wires and placing it atop of the other of said pair of wires so that the corresponding parallel portions of said pair of wires are substantially in overlying relation to each other, and
7. coupling the upper of said pair of wires to the lower of said pair of wires along the substantially parallel, overlying portions of said lengths.

4,136,485
MINIATURE VEHICLE

Lawrence T. Jones, Playa del Rey; Anson Sims, Northridge, and Ashley G. Howden, Los Angeles, all of Calif., assignors to California R&D Center, Culver City, Calif.

Filed Dec. 9, 1976, Ser. No. 748,871
Int. Cl.[2] A63H *29/22*
U.S. Cl. 46—251 **6 Claims**



1. In a miniature vehicle for operating on a track containing electrical power conductors and including a chassis, rear wheels and electric drive means for driving said rear wheels, the improvement in steering apparatus interfacing with said conductors comprising:
a substantially triangular hitch section on said chassis;
a unitary steering block mounted to said chassis on said hitch section;
first and second receptacles in said steering block;
first and second front wheels mounted to rotate on said steering block;
first and second electrical conductive pick-up means floatably mounted in said first and second receptacles, respectively, for maintaining electrical contact to said power conductors, and
means for biasing each floating pick-up means into said electrical contact with said power conductors.

4,136,486
METHOD AND COMPOSITIONS FOR INOCULATING *LEGUMINOSAE* WITH BACTERIA

Alfred A. Franklin, Jr., Sarasota, Fla., and Ian C. McLeod, Okemos, Mich., assignors to Microlife Technics, Inc., Sarasota, Fla.

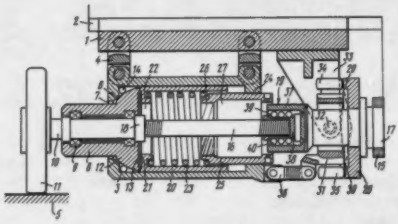
Filed Jan. 6, 1978, Ser. No. 867,312
Int. Cl.[2] A01C *1/06*
U.S. Cl. 47—58 **17 Claims**

1. The method of inoculating seeds of the plant family Leguminosae, particles surrounding the seeds including soil particles or a combination thereof with nitrogen fixing bacteria in order to induce root nodulation which comprises:
(a) providing nitrogen fixing bacteria which are selected to be infective of the particular variety of plant of the seeds to be inoculated as a composition in admixture with water in an amount of at least about 0.99 part water per part of the mixture by weight and with a non-toxic water soluble adhesive agent at a temperature which maintains the viability of the bacteria to produce a mixture containing between about 10^2 and 10^8 bacteria per ml, wherein the adhesive agent is present in an amount less than about 0.1 part per part of the mixture by weight which is sufficient to adhere the bacteria to the seeds or the particles or a combination thereof; and
(b) applying the composition to the seeds, the particles or a combination thereof so that each contain at least about 10^3 bacteria, wherein after application a temperature is maintained prior to planting which provides viability of the bacteria for a period of at least 24 hours.

4,136,487
ARRANGEMENT FOR ABRASIVE MACHINING OF SHAPED SURFACES

Vladimir N. Khokhulin, Srednеokhtinsky prospekt, 26/17, kv. 75; Andrei N. Grachev, ulitsa Ryleeva, 39, kv. 1; Valery G. Shver, Bolshoi prospekt, 104, kv. 24, and Valentin L. Kozlov, prospekt Energetikov, 28, korpus 7, kv. 27, all of Leningrad, U.S.S.R.

Filed Nov. 21, 1977, Ser. No. 853,268
Int. Cl.[2] B24B *17/00*
U.S. Cl. 51—33 R **8 Claims**



1. An arrangement for abrasive machining of shaped surfaces of an intricate profile, comprising:
a base member;
articulated suspensions attached to said base member;
a casing made in the form of a hollow cylinder connected with said base member by said articulated suspensions and having a seat with an opening;
an intermediate sleeve mounted in said seat of said hollow cylinder and having formed thereon a spherical surface coaxial with said intermediate sleeve to serve as a spherical bearing of this sleeve, said spherical bearing having a flat end in a plane extending perpendicular to the axis of said intermediate sleeve;
a tool spindle disposed in said intermediate sleeve; an abrasive tool secured to one end of said tool spindle; a flexible shaft coupled to the other end of said tool spindle;
a rotary drive means for said tool spindle;
an intermediate shaft coupled to said rotary drive means;
a splined joint for joining said flexible shaft to said intermediate shaft;
a device for urging said abrasive tool against the surface to be machined including:
a socket positioned in said hollow cylinder and having an end-face engaging said flat end of said spherical bearing, said end-face of said socket being provided with an opening to receive said flexible shaft,.
a spring for urging said socket against said flat end of said spherical bearing of said intermediate sleeve, and
an urging force adjustment means for adjusting the force urging said socket against said flat end of said spherical bearing; and
a reciprocating drive means for said hollow cylinder including an end-face cam rigidly mounted on said intermediate shaft and a plunger connected with said hollow cylinder and engaged by said end-face cam;
whereby said abrasive tool performs simultaneously a

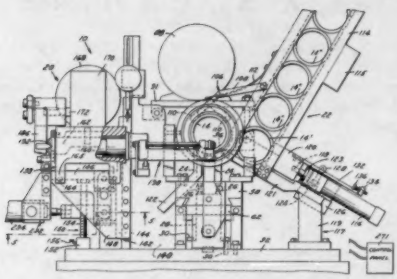
rotary motion and a reciprocating motion along an arc relative to said base member, a constant controlled urging force being directed in a plane extending normal at any point of the surface to be machined.

4,136,488

HONING MACHINE

William G. Wunder, Hamilton, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Aug. 29, 1977, Ser. No. 828,475
Int. Cl.² B24B *5/36*
U.S. Cl. 51—58 **12 Claims**



1. A honing machine for honing an arcuate grooved surface that extends around the circumference of a cylindrical workpiece comprising:

workpiece support means for rotatably supporting the workpiece in a workpiece support position in the machine for rotation about the axis of the workpiece;

spindle drive means for rotating the workpiece while it is being held by the workpiece support means;

oscillation assembly means for holding a honing stone having an arcuate honing surface in abrading engagement with the arcuate surface of the workpiece as the workpiece is rotated, the oscillation assembly means causing the honing stone to be oscillated back and forth as it is held in abrading engagement with the arcuate surface of the rotating workpiece, said oscillation assembly means including:

oscillating tool holder means for holding the honing stone as it is oscillated, the tool holder means oscillating with the honing stone;

non-oscillating tool holder mounting means for supporting the oscillating tool holder means, said tool holder mounting means permitting oscillation of the tool holder means relative thereto, the tool holder mounting means being movable in the honing machine between an engaged position, wherein the honing stone fits into the arcuate grooved surface of the workpiece in abrading engagement therewith, and a disengaged position, wherein the honing stone is moved out of the arcuate grooved surface in the workpiece for insertion and removal of successive workpieces into and out of the honing machine, the tool holder mounting means being pivotably mounted on a base member for pivotal movement with respect to the base member in a direction perpendicular to the axis of the work piece, said movement moving the tool holder mounting means between its engaged and disengaged positions, the tool holder mounting means including an outer side that is pivotably mounted on the base member and an inner side facing the workpiece support means, the inner side being positioned against the base member when the tool holder mounting means is in its engaged position, and the inner side being raised above the base member when the tool holder mounting means is in its disengaged position;

oscillation means for oscillating the tool holder means at least while the honing stone is in abrading engagement with the arcuate surface on the workpiece;

lift means for moving, upon actuation, the tool holder mounting means to its disengaged position to permit removal of the workpiece from the honing machine and insertion of a new workpiece into the machine, the lift means, upon deactuation, causing the tool holder mounting means to move back to its engaged position for honing the newly inserted workpiece, the lift means comprising lift cylinder means for raising the inner side of the tool holder mounting means with respect to the base member so as to move the tool holder mounting means between its engaged and disengaged positions for interchanging workpieces in the honing machine; and

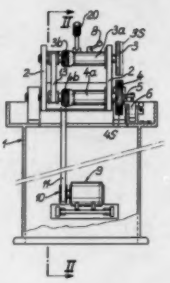
control means for controlling the operation of the honing machine, said control means actuating and deactuating the lift means for insertion and removal of successive workpieces into and out of the machine.

4,136,489

GRINDING AND POLISHING MACHINE

Pierre von Allmen, Neuchatel, Switzerland, assignor to Esco S.A., Switzerland

Filed Dec. 3, 1976, Ser. No. 747,186
Claims priority, application France, Dec. 10, 1975, 75 38401; Oct. 4, 1976, 76 30410
Int. Cl.² B24B *3/60, 41/04*
U.S. Cl. 51—98 BS **4 Claims**



1. A machine for successively grinding and polishing workpieces, in particular tools such as gravers of hard metal, comprising:

a frame;

a workpiece carrier on the frame;

a grinding wheel and a polishing wheel rotatably mounted about parallel axes and having a support movable relative to the frame between a first position in which an operative surface of the grinding wheel is placed to grind a workpiece carried by the carrier and a second position in which an operative surface of the polishing wheel is placed to polish the workpiece;

means for mounting a movable one of the polishing wheel and the workpiece carrier for movement relative to the other and relative to the grinding wheel in a direction parallel to the axes and for precisely setting an extreme position of the movable one of the polishing wheel and workpiece carrier in said direction to limit its movement towards the other, so that in the extreme position when the support is the second position the operative surface of the polishing wheel is accurately positioned relative to the workpiece in the same position as the operative surface of the grinding wheel when the support is in the first position; and

means for moving the movable one of the polishing wheel and workpiece carrier into the extreme position;

the workpiece-carrier being movable in said direction, the means for moving comprising a cam track cooperating with a cam-follower to move the workpiece-carrier in response to movement of said support between the first and

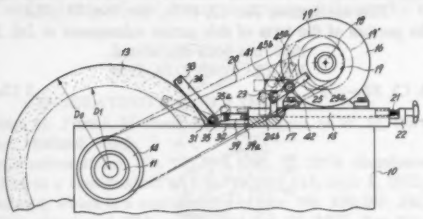
second positions, and the means for setting comprising means for adjusting the position of the cam track.

4,136,490

APPARATUS FOR PREVENTING CIRCUMFERENTIAL OVERSPEEDING OF A GRINDING WHEEL

Shinji Tange, Aichi, and Akihiro Matsuura, Kariya, both of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Kariya, Japan

Filed Nov. 29, 1977, Ser. No. 855,614
Claims priority, application Japan, Nov. 30, 1976, 51-144518
Int. Cl.[2] B24B *55/00*
U.S. Cl. 51—134.5 R **6 Claims**



1. An apparatus for preventing circumferential overspeeding of a grinding wheel in a grinding machine having a wheel head rotatably carrying a wheel spindle for supporting said grinding wheel, a motor base slidably mounted upon said wheel head for movement in a direction transverse to the axis of said wheel spindle, a motor fixed on said motor base for rotating said wheel spindle through a belt, and large and small diameter motor pulleys alternatively attachable to a motor shaft of said motor, the apparatus comprising:

a first link having a first rejection member protruding therefrom, said first link being pivotably carried on said motor base to move said first rejection member to and away from one of said motor pulleys on said motor shaft;

a second link having a second rejection member protruding therefrom, said second link being pivotably carried on said wheel head to move said second rejection member to and away from said grinding wheel;

transmitting means for transmitting pivotal movement of said first link to said second link so as to prevent, by said first rejection member, an attachment of said large diameter pulley to said motor shaft when a grinding wheel having a diameter greater than a predetermined pulley exchange diameter is on said wheel spindle without interference with said second rejection member; and

a parallel motion mechanism incorporated in said transmitting means for causing the same to operate without being affected by movement of said motor base.

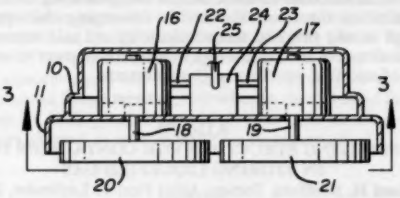
4,136,491

FLOOR SANDING MACHINE WITH CONTROLLABLE MOTION

William H. Redifer, 116 Maywood Dr., Youngstown, Ohio 44512

Filed Mar. 9, 1977, Ser. No. 775,793
Int. Cl.[2] B24B *23/02*
U.S. Cl. 51—177 **5 Claims**

1. In a floor sanding machine having a housing and a supporting structure therein, a pair of electric motors on said supporting structure in side by side relation, drive shafts on said motors extending downwardly from said supporting structure and housing and a pair of discs on said drive shafts, means for varying the speed of said electric motors individually, a handle on said floor sanding machine extending at a right angle to a line intersecting said drive shafts of said electric motors, individual control means on said handle and secondary means interconnecting said individual control means and said means for varying the speed of said electric motors and a power source for said electric motors whereby manual operation of said individual control means varies the speeds of said individual electric motors and the discs driven thereby so as to cause the sanding machine to move to the right or left of a path on which the floor machine is traveling.

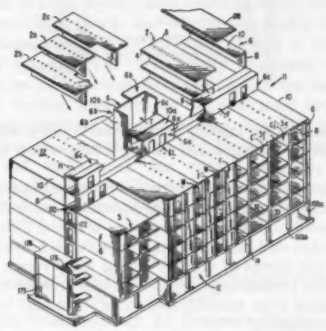


4,136,492

INDUSTRIALIZED BUILDING CONSTRUCTION

John H. Willingham, 1280 Estate Dr., Memphis, Tenn. 38117

Continuation of Ser. No. 80,540, Oct. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 807,217, Mar. 14, 1969, abandoned. This application Jun. 4, 1973, Ser. No. 366,409
Int. Cl.[2] E04H *9/06*
U.S. Cl. 52—79.7 **13 Claims**



1. A building construction for human occupancy having a plurality of cells each including at least a floor, a ceiling, and a pair of oppositely disposed side walls comprising first, second and third elements forming portions of said cells, each of said first and third elements including an elongated member having a stem and a flange extending substantially normal to said stem along one side thereof, said second element including a member having a stem and a pair of flanges extending substantially normal to said stem along opposite sides thereof, said first, second and third elements being arranged in respective substantially side-by-side relation with said second element intermediate said first and third elements, the respective flanges of said second element lying in opposed relation with the flanges of said first and third elements, the stems of said first and second elements and said second and third elements lying in spaced generally parallel planes and respectively forming the generally oppositely disposed side wall portions of cells defined therebetween, a fourth element forming portions of said cells, said fourth elements comprising a box like member having side and end walls and a horizontal wall lying in a plane containing common edge portions of said side and end walls, said fourth element having a lateral dimension substantially coextensive with the width of said second element, said fourth element being disposed between said first and third elements and adjacent an end of said second element with said horizontal wall lying in substantial coplanar relation with the flanges of said first, second and third elements, the walls of said fourth

element forming wall portions of said cells, said stems and said latter wall portions extending substantially he entire distance between the floors, and ceilings of said cells sufficiently to at least accommodate an adult human being standing in an erect position on the floor, and means connecting the opposing flange of said first and second elements and said second and third elements and connecting said fourth element to at least one of said first, second and third elements.

4,136,493

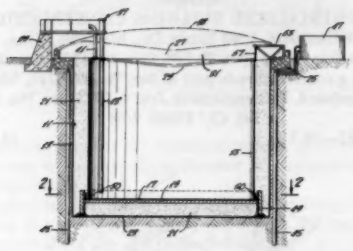
SUPPORTING STRUCTURE FOR CONTAINERS USED IN STORING LIQUEFIED GAS

Rolland H. Bradford, Tucson, Ariz.; Paul V. Laylander, Irvine, and Anthony J. Baranyi, Costa Mesa, both of Calif., assignors to NRG Incorporated, Phoenix, Ariz.

Continuation of Ser. No. 579,870, May 22, 1975, abandoned. This application Sep. 20, 1976, Ser. No. 724,805

Int. Cl.[2] B63B *25/12*; F17C *7/02*

U.S. Cl. 52—169.7 **16 Claims**



1. Apparatus for storing a cryogenic liquid comprising:
an outer structural vessel having a height and width in excess of 10 feet;
an inner structural vessel spaced from said outer structural vessel throughout its entire perimeter and bottom;
granulated compressible insulation material filling the void between said inner and outer vessels, said insulation being the sole means of support of said inner vessel; and
means for prohibiting migration of said granulated insulation material from beneath said inner structural vessel to the sides thereof.

4,136,494

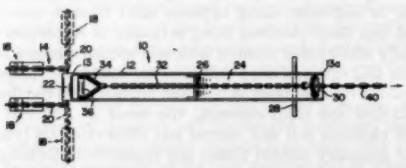
TRIANGLE CHAIN ANCHOR

Robert W. Jameson, 1690 Nutwood Rd., Akron, Ohio 44305

Filed Apr. 24, 1978, Ser. No. 899,536

Int. Cl.[2] E02D *5/74*

U.S. Cl. 52—166 **5 Claims**



1. An anchor assembly for a flexible stress cable, chain or the like and comprising
an elongate base means having front and back ends,
a tie-down means operatively engaging the back end of said base means to attach it to a support,
a brace member operatively engaging said base means as its front portion thereof and extending upwardly and rearwardly therefrom at an obtuse angle thereto,
a first flexible stress member operatively secured to and extending between said back end of said base means, the upper end of said brace member and the front end of said base means, and
a second flexible stress member engaging said first flexible stress member intermediate the upper end of said brace member and the front portion of said base means and extending forwardly for attachment to a stressing means which is to be attached to the anchor assembly.

4,136,495

WALL PANEL

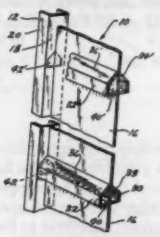
Charles V. Frederick, Rte. #5, Box 132, New Virginia, Iowa 50210

Division of Ser. No. 517,881, Oct. 25, 1974, Pat. No. 3,971,180. This application Jul. 22, 1976, Ser. No. 707,753

The portion of the term of this patent subsequent to Jul. 27, 1993, has been disclaimed.

Int. Cl.[2] E04B *1/16, 2/34*

U.S. Cl. 52—251 **2 Claims**



1. A building panel, comprising,
U-shaped side members each having a web portion and outwardly disposed spaced apart flange members, said side members being oppositely disposed in a spaced apart relation with the flanges thereof extending outwardly in opposite directions,
a plurality of spaced apart sheet members extending between said web portions and being secured thereto, and
a plurality of stiffener members extending between said side members on opposite sides of said sheet members and covering the adjacent edges of adjacent sheet members to form an enclosed compartment along said adjacent edges with said compartment having openings at each end thereof adjacent to said web portions, said stiffener members having a beveled outer surface and being free from an upwardly exposed horizontal surface so that particulate material will not lodge thereon when said panel is in a vertical position,
said web portion containing apertures in communication and alignment with said compartment openings.

4,136,496

STRUCTURAL ELEMENTS FOR SUB-FRAMES

George Molyneux, Plymouth, England, assignor to Radway Plastics Limited, England

Filed Feb. 21, 1978, Ser. No. 879,567

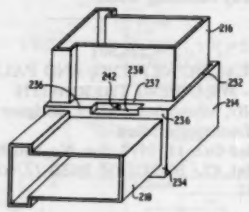
Claims priority, application United Kingdom, Jan. 28, 1978, 3582/78

Int. Cl.[2] E06B *3/04*; F16B *11/00*

U.S. Cl. 52—302 **10 Claims**

1. A structural assembly for use in a building comprising a pair of strip elements which form adjacent horizontal and vertical sides of a frame and a corner piece joining said two strip elements together, said corner piece comprising a hollow body, formations at right angles to each other on said hollow body providing respective spigot-and-socket connections with said two strip elements, said body of said corner piece having a moisture retaining wall arranged so that moisture draining from one of said strip elements into said corner piece, on that

side of said moisture retaining wall which includes the spigot-and-socket connection for the strip element which provides



said vertical side of said frame, is contained therein by said wall.

4,136,497

INSULATING PANEL CONSTRUCTION

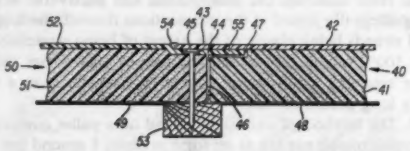
William H. Porter, Holland, Mich., assignor to W. H. Porter, Inc., Holland, Mich.

Continuation of Ser. No. 519,403, Oct. 31, 1974, abandoned, which is a continuation of Ser. No. 367,113, Jun. 5, 1973, abandoned, which is a continuation of Ser. No. 159,295, Jul. 2, 1971, abandoned. This application Jul. 23, 1976, Ser. No. 708,102

The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.² E04C *2/08*

U.S. Cl. 52—593 **6 Claims**



1. In combination, a plurality of abutting, interlocked prefabricated non-load-bearing, insulating panels, suitable for use in refrigerated enclosures such as food processing rooms, cold rooms, and the like, of substantially uniform width and thickness, except for a debossed area along a panel edge adapted to underlie a portion of an adjacent panel, each panel comprising a core slab of an insulating material; a rigid facing sheet bonded to the core slab on at least one side thereof; an integral sheet-form planar flange member along one edge of and consisting in an extension of the facing sheet and extending beyond an underlying one end of the core slab, the upper surface of said flange member lying in the plane of the upper surface of said facing sheet and the under surface of said flange member lying in the plane of the under surface of said facing sheet; and an integral, sheet-form, planar debossed flange member which extends along and consists in an extension of a facing sheet edge and substantially parallel to said planar flange member, said debossed member being displaced inwardly a distance equal to the thickness of said flange member so that its upper surface lies substantially in the plane of the under surface of said flange member and having a portion supported by an underlying opposite end of the core slab and another portion extending beyong the underlying opposite end of the core slab and having a width substantially the same as the supported portion thereof; said flange member, said debossed flange member, and said facing sheet being integral parts of a continuous sheet having a uniform thickness throughout its extent; said flange member being essentially co-extensive with said debossed member; said core slab along one edge of said panel being cut away directly underlying the planar flange member to form with said facing sheet a slot essentially co-extensive with the extended edge of the debossed flange member and having received therein the extended edge of a debossed flange member with substantial abutment of the core slab edges of two adjacent panels substantially at the mid-portion of the juncture formed by said flange member of one adjacent panel overlapping the debossed flange member of the other adjacent panel, with the surface of said core slab within said slot being in substantial engagement with a surface of the extended edge of said debossed flange member, and with the planar flange member of one panel overlapping the debossed flange member of an adjacent panel and engaging the outer surface only of said debossed flange member, and wherein the debossed flange member of each panel is provided with a series of spaced openings adapted to receive fasteners therethrough.

4,136,498

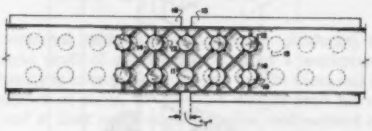
BLOCK OR BRICK LAYING GUIDE REINFORCING MODULE

Cecil Kanigan, 1830-6th Ave., North, Regina, Canada

Filed Dec. 5, 1977, Ser. No. 857,818

Int. Cl.² E04C *2/04, 1/10*

U.S. Cl. 52—604 **13 Claims**



1. A block or brick laying guide and reinforcing module for vertically apertured blocks and bricks, comprising a web of material substantially rectangular when viewed in plan and a plurality of upwardly and downwardly projecting members extending from the opposing faces of said web and adapted to engage the vertical apertures of the associated blocks and bricks thereby centering adjacent courses, providing and maintaining horizontal positioning of said blocks and bricks and providing and maintaining the vertical spacing between courses, and a plurality of radially extending fins formed on the exterior surface of said member.

4,136,499

METHOD FOR MAKING A REINFORCED WALL OR FOUNDATION

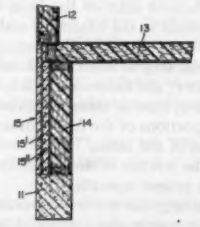
Walter Nilsen, Prins Oscarsgt. 32, Drammen, Norway

Filed Sep. 26, 1977, Ser. No. 836,460

Claims priority, application Norway, Sep. 27, 1976, 763301; Mar. 25, 1977, 771060

Int. Cl.² E02G *27/00*

U.S. Cl. 52—741 **4 Claims**



1. A method of building a house or the like comprising forming a wall supporting foundation; assembling a plurality of panel elements on said foundation to form exterior walls of a first level of said house; disposing a reinforcing structure about said walls and spaced from exterior surfaces thereof; mounting a floor and walls for an upper level of said house upon upper edges of said panel elements and thereafter incorporating said reinforcing structure into walls with said panel elements by applying a settable mass thereto, said panel elements having a

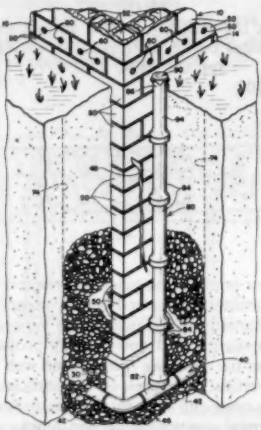
particular thickness and said walls for said upper level having a similar thickness, said walls of said upper level being disposed above and offset from said said panel elements, and wherein said mass is applied to said exterior walls of said first level to a thickness whereby the surface of said mass is contiguous with an outer surface of a wall of said upper level.

4,136,500

BASEMENT WATERPROOFING SYSTEM

Dante DiFiore, 5387 Wilson Mills Rd., Highland Heights, Ohio 44143

Filed Mar. 30, 1978, Ser. No. 891,685
Int. Cl.[2] E04B *1/00*; E04G *21/00*
U.S. Cl. 52—742 **12 Claims**



1. A method of overcoming the problem of water seeping into the basement of a dwelling or other structure of the type having a basement wall supported atop a poured concrete footer, at least portions of the basement wall being hollow, and of the type having a footer drainage tile system extending around the perimeter of the footer, the method comprising the steps of:

(a) treating the basement wall portions by:

(i) forming a plurality of openings in the basement wall portions to provide communciation with the hollow interior of the basement wall portions;

(ii) pumping a hardenable filler material in fluid form through the openings into the hollow interior to fill and to effect a sealing of the hollow interior as the filler material hardens; and,

(iii) after the hollow interior has been filled, closing the openings formed in the basement wall portions; and,

(b) treating the footer drainage tile system by:

(i) digging a plurality of holes at spaced locations around the perimeter of the basement wall to expose the footer drainage tile system at these locations;

(ii) removing portions of the footer drainage tile system at the locations of the holes;

(iii) cleaning the interior of the footer drainage tile system to assure its proper operation;

(iv) reconstructing the removed portions of the footer drainage tile system and providing each of the reconstructed portions of the system with a clean-out branch extending upwardly through the region of its associated hole to provide an open upper end near ground level, whereby a plurality of near-ground-level accesses communicating with the footer drainage tile system are provided;

(v) capping the open upper ends of the clean-out branches with removable cover structures; and,

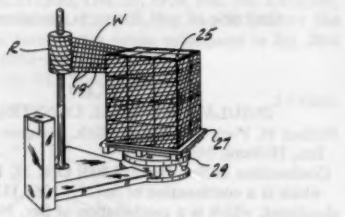
(vi) refilling the holes with at least lower regions of the holes being filled with porous particulate material to provide reservoirs surrounding the reconstructed portions of the footer drainage tile system for receiving and temporarily retaining water.

4,136,501

ELASTIC PLASTIC NETTING, AND PALLET LOAD WRAPPING THEREWITH

Hugh R. Connolly, Minnetonka, Minn., assignor to Bemis Company, Inc., Minneapolis, Minn.

Filed Oct. 11, 1977, Ser. No. 840,892
Int. Cl.[2] B32B *5/04*; B65B *11/00*
U.S. Cl. 53—461 **28 Claims**



1. Plastic netting in the form of a continuous web having strands extending generally longitudinally of the web spaced at intervals transversely of the web and strands extending generally transversely of the web spaced at intervals longitudinally of the web, the netting being formed of a thermoplastic synthetic resin material, the longitudinal and transverse strands being integrally joined at the intersections thereof, the longitudinal strands being elastic to the extent of being stretchable at least 100% when stretched at the rate of 1000% per minute while retaining a substantial degree of elasticity over a relatively long period of time.

25. The method of stabilizing a load on a pallet comprising wrapping plastic netting as set forth in claim **1** around the load with the longitudinal strands of the netting extending in the direction of wrap and, as the netting is wrapped around the load, stretching the longitudinal strands of the netting at least 25%, and securing the netting in place on the load with the longitudinal strands so stretched, thereby to maintain the load bound in place on the pallet, the netting allowing for ventilation of the load.

27. A pallet load wrapped with plastic netting as set forth in claim **1** with the longitudinal strands of the netting extending in the direction of wrap and stretched at least 25%, thereby maintaining the load bound in place on the pallet while allowing for ventilation of the load.

4,136,502

INFLATER SEALER MACHINE

William S. Shore, Pepper Pike, Ohio, assignor to See-Pak Corporation, Cleveland, Ohio

Filed Apr. 6, 1977, Ser. No. 785,238
Int. Cl.[2] B65B *57/00*, *31/06*
U.S. Cl. 53—493 **5 Claims**

4. A machine for inflating and sealing a container comprising:

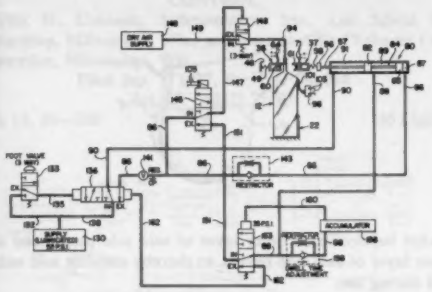
a pair of clamping means capable of moving together for holding portions of the container together;

stationary means extending into the clamping means for inflating the container with gas;

a pair of sealing means adjacent to the clamping means and capable of moving together to seal together the portions of the container while inflated;

a control system having means for sequentially moving the pair of clamping means together and moving the pair of sealing means together, the control system also having means for actuating the inflating means; and

means for physically sensing the expansion of the container as it is inflated, said sensing means operatively connected



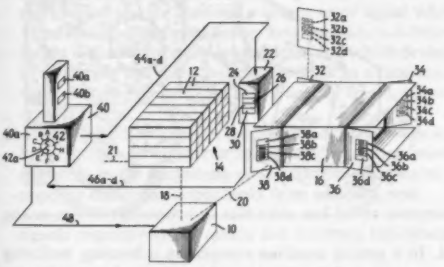
to said actuating means to halt the flow of gas when the container is inflated.

4,136,503

ERROR-DETECTION SYSTEM FOR PACKAGING OF ARTICLES AND ENCODED CONTAINER BLANK THEREFOR

Douglas C. Miller, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,218
Int. Cl.[2] B65B *57/06, 57/18*
U.S. Cl. 53—507 **6 Claims**



1. A system for providing output indication of matching errors as between diverse articles and containers for assembly therewith and bearing plural bit article designation, comprising:

(a) indicator means providing said output indication upon application thereto of an energizing voltage of predetermined character;

(b) sensor circuit means for simultaneously examining such designation bits and generating voltages of character inclusive of that of said energizing voltage and other character in a pattern unique for each such examined container and indicative of the article designation thereof; and

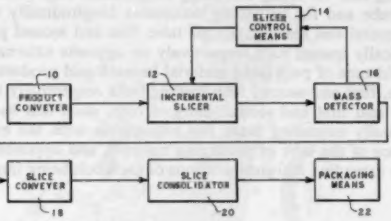
(c) article-designator means comprising variably-settable switch means for each said designation bit series-connected between said sensor circuit means and said indicator means, said article-designator means being settable for each of said articles by single common input to all said switch means to supply such energizing voltage generated by said sensor circuit means to said indicator means exclusively when the voltage pattern generated by said sensor circuit means is indicative of a container having article designation diverse from such article-setting of said article-designator means.

4,136,504

SLICING METHOD

Ihor Wyslotsky, 3311 Montmarte, Hazelcrest, Ill. 60429

Continuation-in-part of Ser. No. 721,953, Sep. 10, 1976, abandoned. This application Aug. 10, 1977, Ser. No. 823,537
Int. Cl.[2] B65B *63/00;* **B26D** *4/34, 5/34*
U.S. Cl. 53—435 **17 Claims**



1. An improved method of automatically producing a selected weight draft of sliced product from a workpiece of variable density in substantially uniform weight slices and in an integral number of slices, the selected weight draft having a first slice and at least one succeeding slice, said method comprising:

selecting an integral number of slices for each draft and thereby determining the preferred weight for each slice;

detecting from the workpiece a first indicium of weight for the first slice and determining therefrom the slice thickness which will produce a first slice of substantially the preferred weight;

incrementally advancing the workpiece the determined thickness;

cutting the first slice of the determined thickness from the workpiece;

detecting from the first slice as cut a second indicium of weight;

detecting from the workpiece face the first indicium of weight for a next succeeding slice and determining therefrom, and from the second indicium of weight for the first slice, the thickness which will produce a next succeeding slice of substantially the preferred weight;

repeating the steps of incrementally advancing, cutting, and said detecting the first and second indicia of weight until the selected integral number of slices has been cut; and

conveying the slices away.

4,136,505

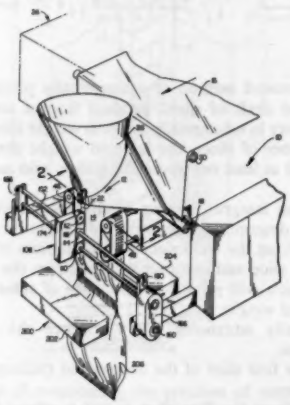
TUBELESS VERTICAL FORM, FILL AND SEAL PACKAGING MACHINE WITH IMPROVED FEED MEANS

Roger L. Putnam, Jr., East Longmeadow; Richard H. Shultz, Longmeadow, and Edward F. O'Brien, Northampton, all of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed Nov. 11, 1977, Ser. No. 850,667
Int. Cl.[2] B65B *9/12*
U.S. Cl. 53—551 **21 Claims**

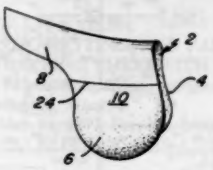
1. A tubeless vertical form, fill and seal packaging machine comprising a source of flexible packaging material in the form of an elongated thin flat strip of material of uniform width comprising successive flat package blanks as integral longitudinally contiguous sections thereof, a tube former adapted to receive said strip material and to progressively form the same to a depending and upwardly open tubular configuration, opposite longitudinal edge portions of the material being progressively juxtaposed by said former so as to extend vertically in parallel relationship for side sealing, product dispensing means above said former and operable for the gravity discharge of measured quantities of product, vertically open

tubular product guide means beneath said product dispensing means for receiving said measured quantities of product and for directing the same downwardly to the interior of the tube of packaging material through its said upwardly open end, said means extending vertically within said tube former in radially spaced relationship therewith and within the tube of packaging material formed therein, side and end sealing means disposed beneath said tube former and guide means respectively for sealing said vertically extending longitudinal edge portions of the tube and for providing successive longitudinally spaced horizontal end seals across the tube, first and second pairs of vertically spaced rolls respectively on opposite external sides of said tube of packaging material beneath said product guide mean, first and second tube feeding belts respectively trained over said first and second pairs of rolls, each belt having a vertically extending inner run engageable with the external surface of the tube of packaging material, and opposite vertically extending marginal portions of each belt being imperforate and an intermediate portion thereof perforate, vacuum generating means communicating with at least said intermediate perforate portions of each of said belts along their said inner runs to cause the belts to grip the tube of packaging material with the inner belt runs in engagement therewith, tube guide and belt back-up means disposed within the tube of packaging material in engagement with its internal surface and extending vertically opposite at least each imperforate marginal portion of each belt inner run whereby to prevent lateral vacuum loss and to provide for frictional tube feeding action with the inner belt runs externally engaging the tube, and means for driving at least one roll in each of said first and second pairs of rolls to cause said inner belt runs to travel downwardly in unison and thereby to effect combined vacuum-friction tube feeding action positively drawing the tube of material downwardly through the former and successively presenting said integral package blanks therebeneath in tubular form for filling, sealing and package formation.

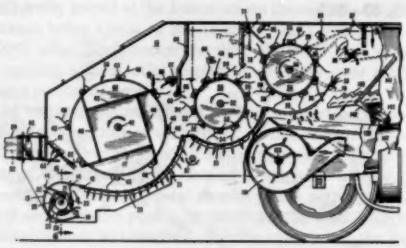


4,136,506
SADDLE PAD
Jacob Miller, Santa Barbara, Calif., assignor to Miller Harness Company, New York, N.Y.
Filed Aug. 4, 1976, Ser. No. 711,466
Int. Cl.[2] B68C *1/12*
U.S. Cl. 54—66 **4 Claims**

1. A saddle pad for use in connection with riding saddles including depending panel portions extending downwardly on either side of the tree of the saddle, said saddle pad comprising an upper portion contoured to receive the seat portion of said saddle, and a pair of side panels depending downwardly from said upper portion, each of said side panels comprising an outer layer and an inner layer to define a pocket therebetween, and slot means associated with said outer layer of said side panels, so that substantially the entire saddle panel portions below the saddle tree may be inserted into said slot means, and into said pocket between said outer layer of said side panels and said inner layer of said side panels, to thereby stabilize said saddle pad during use.



4,136,507
PEANUT COMBINE
Oliver K. Hobbs, P.O. Box 1306, Suffolk, Va. 23434
Filed Sep. 13, 1973, Ser. No. 396,806
Int. Cl.[2] A01D *41/10*
U.S. Cl. 56—126 **29 Claims**

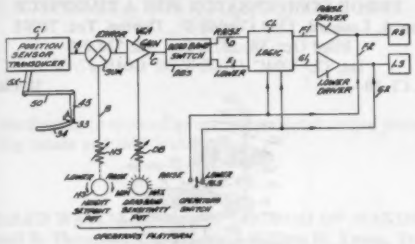


1. In a peanut combine comprising a housing enclosing a space, a series of thrashing members disposed across the space for removing peanuts from peanut laden vines disposed with respect to each other whereby the vines are transferred from the first of the series to the next in the series, and means for separating the removed peanuts from the vine remnants after thrashing, the improved thrashing member which comprises a shaft disposed transversely across the space enclosed by the housing, means for rotating the shaft as the combine moves over the ground, a parallelepiped shaped member disposed about and enclosing the shaft, a circular end plate fixed to the shaft for rotation therewith and closing each end of said parallelepiped shaped member and having a diameter which is greater than the cross-section of the parallelepiped shaped member, each of the walls of the parallelepiped shaped member extending on one side only outwardly beyond the adjacent wall to the circumference of the circular plates, a bar fixed to the circumferences of the end plates and extending across the space therebetween at each point where a wall of the parallelepiped shaped member intersects the circumference of the plate member, a plurality of flexible thrashing fingers spaced along each bar, and a vine guide means disposed across the housing below the forward peripheral edge of the said improved thrashing member, said guide means comprising spring-backed plates spaced across the width of the combine and inclined downwardly in front of the improved thrashing member.

4,136,508
CLOSED-LOOP COMBINE HEADER HEIGHT CONTROL

Martin W. Coleman, Independence, Mo., and Edwin M. Northup, Milwaukee, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Jan. 7, 1977, Ser. No. 758,064
Int. Cl.[2] A01D 75/28
U.S. Cl. 56—208 36 Claims



1. A closed loop header height control for a crop harvester having a vertically adjustable cut crop receiving header comprising, in combination,

position sensor means for deriving an electrical header height signal which continuously is an analog of the minimum clearance between said header and ground,

setpoint adjusting means for deriving a selectively variable electrical setpoint signal indicative of desired height of said header,

means for comparing said header height signal to said setpoint signal and for deriving a height error signal whose value is null when actual header height equals said desired height indicated by said setpoint signal and which deviates in magnitude and direction from said null as a function of the deviation between said actual header height and said desired height,

deadband establishing means for deriving electrical raise and lower command signals in response to a predetermined deviation in the magnitude of said height error signal in opposite directions respectively from said null, and

power means responsive to said raise and lower command signals respectively for raising and lowering said header.

4,136,509
APPARATUS FOR HARVESTING VEGETABLE HEADS

Don H. Lenker; Dennis F. Nascimento, and Paul A. Adrian, all of Salinas, Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 20, 1977, Ser. No. 789,377
Int. Cl.[2] A01D 45/26
U.S. Cl. 56—327 R 2 Claims

1. An apparatus for harvesting non-colinear vegetable heads, which comprises -

(a) a frame,

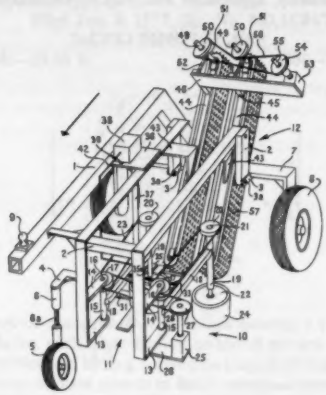
(b) sensing means mounted on said frame, laterally movable to engage the non-colinear vegetable heads, for distinguishing mature heads by size in a row of heads to be harvested, said means including

a head-engaging unit comprising a pair of parallel pivotable arms with counter-rotating rollers about 30–40 centimeters in diameter with an outer perimeter of pliable material about 2–3 centimeters thick mounted to move laterally away from each other, said movement being resisted by a mutual tension means,

guide means for maintaining said arms parallel, and

an electrical mechanism including a selector potentiometer cooperative with said head-engaging unit and a reference potentiometer cooperative with said head-engaging unit and said selector potentiometer for distinguishing mature heads by size in a row of heads to be harvested,

(c) means mounted on said frame responsive to said sensing means for cutting the mature heads including a horizontal knife blade rotatable 180° for each head cut, and

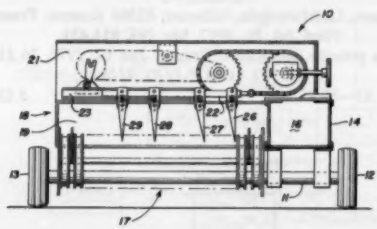


(d) means for lifting cut heads from the cutting area including a pair of counter-rotated lifting belts, said means leaving uncut heads intact.

4,136,510
FEEDER FINGER ASSEMBLY FOR HAY BALERS

LeRoy A. Crawford, New Holland, Pa., and Paul S. Trible, Delaplane, Va., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Aug. 19, 1977, Ser. No. 825,999
Int. Cl.[2] A01D 39/00
U.S. Cl. 56—341 18 Claims



1. A feeder finger assembly for use in the feeding mechanism of a hay baler, said assembly comprising:

(a) a bracket member having means thereon for affixment to a driven element of the feeding mechanism, said bracket member including a first substantially planar engagement surface having first friction means thereon;

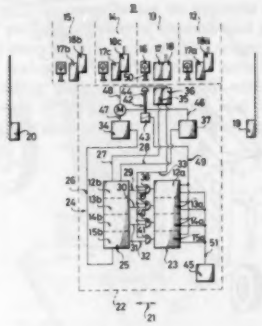
(b) an elongate substantially straight feeder finger having a first end and a second end, said finger including a second substantially planar engagement surface on said first end thereof having second friction means thereon; and

(c) adjustable holding means forcing said first and second engagement surfaces together such that said first and second friction means prevent relative movement between said bracket member and said feeder finger.

4,136,511
METHOD AND DEVICE TO DETERMINE DEFECTIVELY OPERATING SPINNING STATIONS

Hans Raasch, Mönchen-Gladbach, Germany, assignor to W. Schlafhorst & Co., Mönchen-Gladbach, Germany

Filed Aug. 8, 1977, Ser. No. 822,794
Claims priority, application Fed. Rep. of Germany, Aug. 7, 1976, 2635714
Int. Cl.[2] D01H *13/22*
U.S. Cl. 57—265 14 Claims

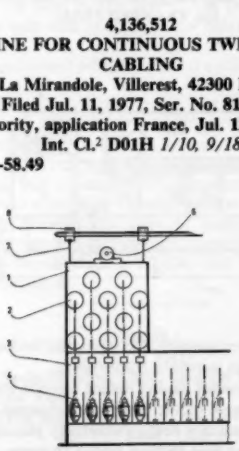


5. Device for performing a method of determining incorrectly operating spinning stations of a spinning machine comprising separate counting means located at the respective spinning stations at least at a given time at which they are effective for counting the number of anomalous interruptions of the operation exclusively at the respective spinning stations, a mobile operating device capable of traveling relatively to the spinning stations and including means for interrogating said counting means at time intervals to determine the count, and means for issuing a fault signal automatically in response to at least the reaching of a predetermined count of the respective counting means for the spinning stations.

4,136,512
MACHINE FOR CONTINUOUS TWISTING AND CABLING

Jean Venot, La Mirandole, Villerest, 42300 Roanne, France

Filed Jul. 11, 1977, Ser. No. 814,431
Claims priority, application France, Jul. 12, 1976, 76 21370
Int. Cl.[2] D01H *1/10, 9/18*
U.S. Cl. 57—58.49 3 Claims



1. A continuous twisting and cabling machine comprising a yarn feeding and twisting section, a cabling and rewinding section positioned below the twisting section, the twisting section including a series of removable assemblies, each removable assembly supporting:

(i) a series of twist spindles,

(ii) control means driven by a motor fixed on said feeding and twisting section and associated with brake means for said spindles,

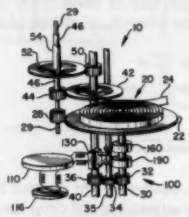
(iii) connecting means for connecting the assembly to a transporter, and

(iv) fixing means for attachment to the cabling and rewinding section.

4,136,513
ERROR COMPENSATOR FOR A TIMEPIECE

Vivian A. Leonard, 1200 Cordell St., Denton, Tex. 76201

Filed Oct. 18, 1976, Ser. No. 733,299
Int. Cl.[2] G04C *13/08, 9/00;* G04B *27/00*
U.S. Cl. 58—34 10 Claims



1. A compensator for correcting time loss or gain in minute and hour hand works in a time-keeping mechanism wherein signals are received and converted into first and second electrical signals at predetermined time intervals, comprising:

(a) a servo unit for receiving the electrical signals, and upon receiving the first signal, the servo unit driving a first lever to contact and drive a first pin to a first position, and upon receiving a second signal, the servo unit driving a second lever to contact and drive a second pin to a second position;

(b) a first clutch fixed to the first pin, rotatively coupled to a main drive shaft of a main drive assembly, and drivably connected to minute and hour hand works, the first clutch adapted to uncouple the minute and hour hand works from the main drive assembly when the first pin is driven to the first position, the first clutch further adapted to drive the minute and hour hand works to a first time setting; and

(c) a second clutch fixed to the second pin, rotatively coupled to the main drive shaft of the main drive assembly, and drivably connected to the minute and hour hand works, the second clutch adapted to drive the minute and hour hand works to a second time setting when the second pin is driven to the second position and thereupon to couple the minute and hour hand works to the main drive assembly.

4,136,514
ELECTRO-MECHANIC CALENDAR TIMEPIECE

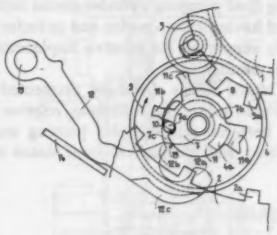
Daniel Rochat, Saint-Blaise, Switzerland, assignor to Ebauches S.A., Canton of Neuchatel, Switzerland

Filed May 13, 1977, Ser. No. 796,768
Claims priority, application Switzerland, May 24, 1976, 6516/76
Int. Cl.[2] G04B *19/24*
U.S. Cl. 58—58 5 Claims

1. An improved calendar electro-mechanic timepiece including a movement gearing and a driving mechanism for at least one calendar indicating member, said driving mechanism including intermittent rotating means for intermittently driving said calendar indicating member and torque generating means for preventing floating of said movement gearing when said drive means is rotating, said improvement comprising:

brake means for generating torque for preventing floating of

said movement gearing when said drive means is not rotating, said brake means cooperating with said driving



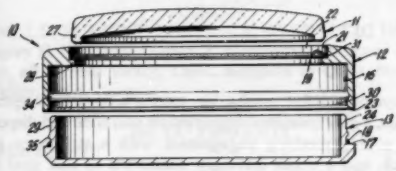
mechanism to sychronise operation of said torque generating means and said brake means.

4,136,515

SEALED WATCH CASE AND METHOD OF MAKING

Harwell B. Thompson, Cheshire, and William H. Young, Trumbull, both of Conn., assignors to Timex Corporation, Waterbury, Conn.

Filed Jan. 3, 1977, Ser. No. 756,207
Int. Cl.[2] G04B *37/08, 39/00;* G10D *11/24*
U.S. Cl. 58—90 R **5 Claims**



1. A sealed watch case assembly comprising:

a watch case member including an upper body portion having downwardly extending peripheral side walls, a first recess extended axially within the upper body portion and second axial recess in the watch case formed by the peripheral side wall, said upper body portion having an inwardly projecting ledge portion forming a crystal seat;

a crystal having an upper surface to enclose the first recess in the watch case and downwardly projecting side wall portions to engage said seat;

a first resilient gasket bead applied to said crystal seat and adapted to receive the downwardly projecting sidewall portions of the crystal to effect sealing action, said first bead being applied to said seat as an uncured elastomeric bead and then being cured in situ prior to assembly so that it is integral and adherent to said seat but nonadherent to the sidewall portions of said crystal when brought into sealed relation therewith during assembly;

a caseback member having a base and upwardly extending peripheral walls for insertion into the second recess in the watch case and having an exterior seat portion protruding outwardly from the walls to receive the downwardly extending side walls of the watch case, and;

a second resilient gasket bead applied to at least one of the case member and caseback member to provide a seal therebetween, said second bead being applied to said one of said members as an uncured elastomeric bead and then being cured in situ prior to assembly so that it is integral and adherent to said one of said members but nonadherent to said other member when placed in sealed relation therewith during assembly;

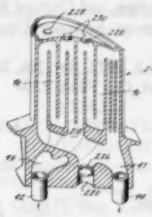
whereby the nonadherence of said first and second gasket beads to said crystal and other member enables the watch case to be disassembled for repair and the like and then reassembled without impairing the sealing effectiveness of said gasket beads.

4,136,516

GAS TURBINE WITH SECONDARY COOLING MEANS

Robert J. Corsmeier, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jun. 3, 1977, Ser. No. 803,162
Int. Cl.[2] F02C *7/16, 7/18*
U.S. Cl. 60—39.09 R **8 Claims**



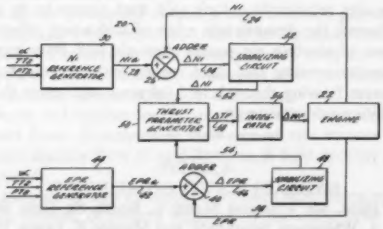
1. A turbine comprising a rotor disk bearing a plurality of turbine blades, each blade having an airfoil portion defining a hollow interior and having a given melting point temperature; a closed-loop coolant system in fluid communication with the hollow blade interiors and providing the primary cooling therefor; a secondary coolant supply; means for fluidly communicating between said secondary coolant supply and the hollow blade interiors; a first filling means disposed within said fluid communicating means; means defining holes through said airfoil portions for the discharge of the secondary coolant; and a second filling means disposed within said holes; and wherein said first and second filling means have a melting point temperature less than that of said airfoil portions.

4,136,517

THRUST CONTROL SYSTEM FOR A GAS TURBINE ENGINE

Harold Brown, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Jul. 6, 1976, Ser. No. 702,526
Int. Cl.[2] F02K *3/00;* F02C *9/04*
U.S. Cl. 60—223 **13 Claims**



6. In a thrust-setting system for a gas turbine engine, the invention comprising:

first means for generating a first error signal indicative of the deviation of a first thrust-indicating parameter of said engine from a first reference value;

second means for generating a second error signal indicative of the deviation of a second thrust-indicating parameter of said engine from a second reference value;

third means responsive to said first and second error signals for providing an output signal in a first mode wherein said first and second means are in normal operating condition and wherein said output signal is indicative of both of said first and second error signals, said third means further providing an output signal in a second mode when said

first means is in an abnormal operating condition and wherein said output signal is not indicative of said first error signal;

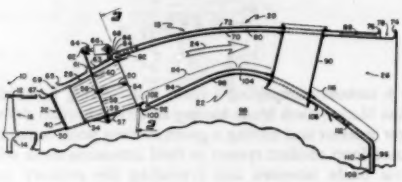
fourth means responsive to said output signal for delivering metered fuel to said engine in order to adjust the thrust output of said engine to correspond to a demanded level.

4,136,518

INFRARED RADIATION SUPPRESSOR FOR A GAS TURBINE ENGINE

John F. Hurley, Huntington, and Clifford R. Banthin, Redding, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed May 3, 1972, Ser. No. 249,827
Int. Cl.[2] F02K *3/04*
U.S. Cl. 60—264 **11 Claims**



1. An infrared suppressor for the hot gas discharge stream from a gas turbine engine, said suppressor comprising:

duct means forming an outlet flow path for the gas stream from said engine;

a plurality of vanes positioned in the inlet end of said duct means in said outlet flow path, said vanes being comprised of a pair of side walls joined at the leading edge of each vane and having trailing edges displaceable away from one another to maintain said vanes in a first configuration and displaceable toward one another to maintain said vanes in a second configuration thereby varying the flow path of the hot gas stream across said vanes, one of said configurations forming converging flow paths for the gas stream emanating from said gas turbine engine, thereby lowering the static pressure thereof below ambient pressure; and

means for forming flow passages for ambient air in heat transfer relationship along said duct means to an outlet adjacent the downstream edge of said vanes whereby a flow of cooling air passes through said flow passages thereby cooling said duct means and into the hot gas stream flowing through said infrared suppressor thereby cooling said gas stream.

4,136,519

HYDRAULIC CYCLOIDAL DRIVE

Harry Field, Mt. Clemens; Monte L. Smith, St. Clair Shores; Jas. A. Whitehead, Southfield, and Monroe E. Learn, Fraser, all of Mich., assignors to Newcor, Inc., Bay City, Mich.

Filed Jul. 26, 1977, Ser. No. 819,153
Int. Cl.[2] F15B *15/18*
U.S. Cl. 60—369 **7 Claims**

1. In a transfer system for use in association with a production machine to permit a workpiece to be transferred from one working station to another, said system comprising:

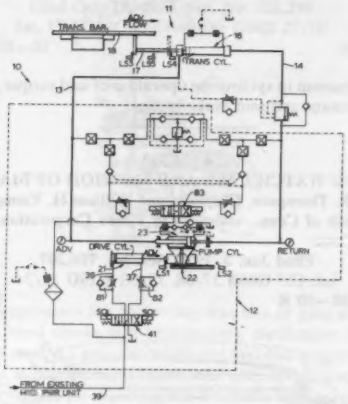
a transfer mechanism mounted on or directly adjacent the production machine and including oscillating shuttle means movable back and forth between first and second locations for effecting transfer of a workpiece therebetween, and fluid power means connected to said shuttle means for effecting the oscillating movement thereof;

a fluid drive unit for supplying pressure fluid to and from the transfer mechanism to effect the oscillating thereof, said fluid drive unit being remotely located relative to said transfer mechanism and including

(1) a frame,

(2) double-acting fluid pumping cylinder means mounted on said frame and having piston means and cylinder housing means slidably supported for relative displacement with respect to one another,

(3) mechanical drive means drivingly connected to said pumping cylinder means for effecting relative slidable displacement between said cylinder housing means and said piston means, said mechanical drive means including



a cycloidal drive mechanism having a linearly reciprocal slide, a gear rotatably supported on said slide and disposed in rolling meshing engagement with a stationary gear rack, and a crank drivingly connected to said gear and disposed in driving engagement with said pumping cylinder means,

(4) drive motor means connected to said slide for causing driving reciprocation thereof; and

conduit means connected between said fluid power means and said pumping cylinder means for forming a closed fluid pressure system.

4,136,520

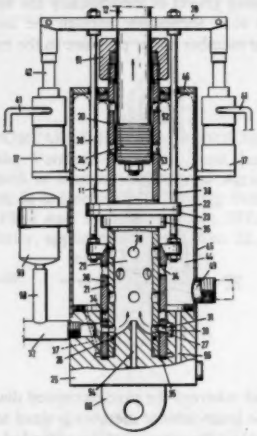
HYDRAULIC PILE DRIVER

Alexander J. Verstraeten, P.O. Box 55, Oostburg, Netherlands

Filed Jun. 15, 1977, Ser. No. 806,720
Claims priority, application Netherlands, Jun. 15, 1976, 7606451
Int. Cl.[2] F15B *1/02*
U.S. Cl. 60—371 **2 Claims**

1. A hydraulic pile driver comprising at least one hydraulic cylinder for raising a tup, a fluid-supply line for passing a fluid under pressure to a cylinder space of the cylinder, and a control slide for periodically connecting the cylinder space to a fluid-discharge line, said control slide being a cuff having apertures therein and mounted within or around part of the peripheral wall of the cylinder for movement from a position in which the fluid under pressure is supplied to the cylinder, to a position in which the fluid under pressure is discharged from the cylinder, characterized by a closed chamber (**44**) provided around the cylinder (**11**), the volume of said chamber being considerably in excess of that of the cylinder space (**29**) of the cylinder (**11**), said fluid-discharge line (**49**) being connected to said closed chamber (**44**), the total area of the apertures (**28, 34**)

in the cuff (30) and in the cylinder wall (21) that are in registry with each other when fluid under pressure is discharged from



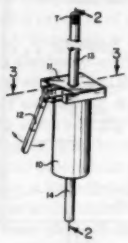
the cylinder space (29) to said closed chamber (44) being at least equal to the cross-sectional area of the cylinder space (29).

4,136,521

MULTI-PURPOSE PORTABLE HYDRAULIC UNIT

Gregory E. Mendoza; Donald R. Henthorn, and James F. Taylor, all of Simi Valley, Calif., assignors to QMA Inc., Simi Valley, Calif.

Filed Nov. 14, 1977, Ser. No. 851,042
Int. Cl.[2] F15B *15/18*
U.S. Cl. 60—477 **5 Claims**



1. A multi-purpose portable hydraulic unit including, in combination:

(a) an outer cylinder;

(b) an inner cylinder coaxial with said outer cylinder to define between the inside wall of said outer cylinder and the outside wall of said inner cylinder an annular reservoir for holding hydraulic fluid;

(c) a piston in the interior of said inner cylinder;

(d) closure means closing off the lower ends of said outer and inner cylinders;

(e) a cylinder head on the upper end of said outer and inner cylinders incorporating hydraulic pump means communicating with first and second passages passing respectively to said annular reservoir and upper interior of said inner cylinder above said piston;

(f) a first piston rod extending from said piston out through said cylinder head;

(g) a second piston rod extending from the opposite end of said piston out through said closure means;

(h) first and second pressure responsive one-way check valves in said first and second passages respectively; and

(i) a bypass valve between said first and second passages permitting passage of fluid from above said piston back to said reservoir after said piston has been driven downwardly by operation of said hydraulic pump means, said valve being manually operable so that said piston can be moved upwardly to a reset position,

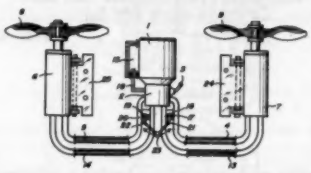
whereby operation of said hydraulic pump means when said reservoir and portion of said inner cylinder above said piston are filled with hydraulic fluid exerts a pulling force on said first piston rod and a pushing force on said second piston rod so that said unit may be used in applications requiring either a pulling or pushing force.

4,136,522

HYDRAULICALLY OPERATED DRIVE- AND CONTROL-UNIT

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Division of Ser. No. 610,872, Sep. 8, 1975, Pat. No. 4,086,768, which is a division of Ser. No. 131,782, Apr. 6, 1971, Pat. No. 3,790,105. This application Aug. 5, 1977, Ser. No. 822,030
Int. Cl.[2] F15B *11/16, 13/09*
U.S. Cl. 60—484 **1 Claim**



1. A driving and controling unit, comprising in combination:

a power plant (prime mover),

at least one fluid flow producing device,

at least a pair of linear or rotary acting hydraulic motors,

said device associated with and driven by said power plant,

said device including a plurality of separated working chamber groups of a plurality of commonly acting fluid displacement chambers and thereto associated displacement means in each of said groups,

said device producing in said groups at least a pair of separated and with respect to each other independent output flows of hydraulic fluid under pressure with the rates of flow of flows in said at least one pair of output flows being constantly proportionate to each other;

separate and independent supply lines delivering one flow of said flows directly to at least one of said motors and at least another flow of said flows to at least another of said motors;

the number of motors supplied by each flow being equal to the number of motors supplied by the other flow of the same pair of flows;

said motors including flow receiving spaces;

said flow receiving spaces of each motor of the same pair of motors being proportionate to each other in volume;

whereby said motors of the same pair of flows receive with respect to one another proportionate rates of flow to one anothers proportionate volumes for actuation and maintenance of at all times relatively to each other proportionate speed of motion of said motors of the same pair of flows;

a common rate of flow adjustment device associated with said fluid flow producing device and to said displacement means of all of said groups for at all times equal relatively to each other variation of rate of flow of said output flows for varying the rate of flow to the said motors in unison and independently of the speed of the power plant for equal variation of the rotary revolutions of said motors; at

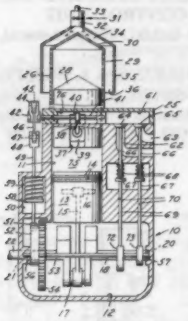
least two variable by pass control valves having each a closed range and an at least partially open range; said valves each communicated to a different line of said separate supply lines and a common bypass control-means for selectively either holding said control valves in said closed range or for selectively opening one of said bypass control valves to a desired extent of the variability of said variable bypass control valves.

4,136,523

STIRLING TYPE ENGINE AND METHOD FOR OPERATING SAME

Jacques O. Pronovost, Guelph, Canada

Filed Jul. 14, 1977, Ser. No. 815,709
Int. Cl.² F02G *1/02*
U.S. Cl. 60—517 **10 Claims**



1. In a Stirling cycle type engine having a cylinder provided with a hot end portion containing a displacer plunger and an opposite end portion containing a power piston, with a cold space between the piston and plunger for cyclically causing gas in the cold space to compress and then move into the hot end portion for heating and expansion to thereby drive the plunger and piston away from the hot end portion, and following which the heated gas returns to the cold space, the improvement comprising:

gas exhaust and inlet ports communicating with said cold space, and valve means normally closing said ports, and means for opening the exhaust port valve means for exhausting the heated gas returned to said cold space and thereafter for opening the inlet port valve means for recharging the cold space with gas prior to the compressing of the gas in said cold space.

4,136,524

APPARATUS FOR SEALING ACCESS HOLES TO CAVITIES WITHIN THE EARTH WITH ROCK GLASS

Robert R. Holman, Bethel Park, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 10, 1976, Ser. No. 740,685
Int. Cl.² E02D *3/08*
U.S. Cl. 405—131 **7 Claims**

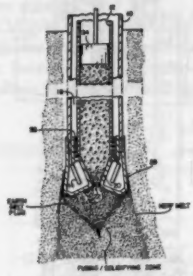
1. Apparatus for fusing and sealing a cavity within a rock formation comprising:

an elongated outer tubular member sized to extend longitudinally within the cavity below the exterior surface of the rock formation surrounding the cavity;

an inner tubular member secured substantially coextensive and concentric with and spaced from the outer tubular member with the inner tubular member being inwardly tapered at one end to be extended within the cavity to form an orifice having a predetermined diameter, the space between the outer and inner tubular member defining an open annulus which is hermetically closed at the extended end;

means for heating the interior of the inner tubular member adjacent the extended end to a temperature sufficient to melt the rock formation; and

means for feeding gravel of substantially the same constituency as the rock formation through the interior of the inner tubular member under pressure to the exterior of the



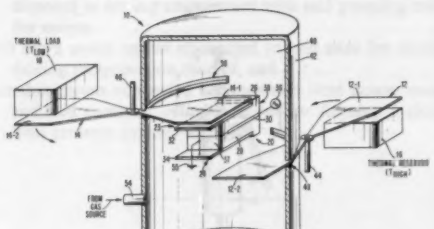
extended end wherein the predetermined diameter of the orifice of the inner tubular member is sized to control the feed of gravel to the exterior of the extended end to a rate which will enable gravel melt within the interior of the inner member.

4,136,525

DIELECTIC REFRIGERATOR USING ORIENTABLE DEFECT DIPOLES

James A. Van Vechten, New Castle, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1976, Ser. No. 755,890
Int. Cl.² F25B *21/02*
U.S. Cl. 62—3 **7 Claims**



1. A refrigerator operable electrocalorically by orientable defect dipoles in a dielectric material subjected to a variable electric field which comprises:

an electrically insulating solid dielectric material having orientable dipole defects dispersed therein;

electrode means for applying a variable electric field in said material; and

thermal energy transport means for exchanging thermal energy between said dielectric material and relatively low and high temperature regions comprising thermal load and thermal reservoir respectively;

said thermal energy transport means includes thermally conductive mechanical means for intermittently and sequentially communicating thermal energy from said load to said material and from said material to said reservoir, and

said thermally conductive mechanical means includes first and second mechanical devices for intermittently and sequentially communicating thermal energy from said

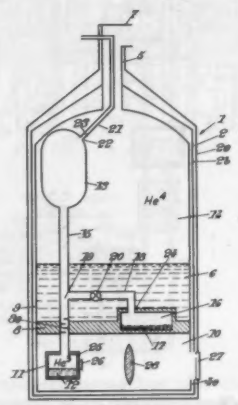
load to said material and from said material to said reservoir.

4,136,526

PORTABLE HELIUM 3 CRYOSTAT

Gerald Chanin, Verrieres-le-Buisson, and Jean-Pierre Torre, Herblay, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Filed Apr. 14, 1977, Ser. No. 787,557
Claims priority, application France, Apr. 22, 1976, 76 11956
Int. Cl.[2] F17C 7/02
U.S. Cl. 62—48 7 Claims



1. A portable helium 3 cryostat, which comprises, disposed inside a portable helium 4 cryostat of a known type, an assembly comprising a lower evaporation chamber containing, in operation, helium 3 in the liquid state, an upper reservoir, a first pipe connecting the reservoir to the evaporation chamber, an adsorption chamber containing an adsorbent which does not become effectively adsorbent for helium 3 until below a critical temperature, higher than the vaporisation temperature of helium 4, and a second pipe which connects the adsorption chamber to the first pipe, a valve being disposed in the second pipe, either at the inlet or at the outlet thereof, for isolating the adsorption chamber from the sub-assembly formed by the reservoir, the evaporation chamber and the first pipe, said assembly, hermetically sealed, enclosing a gaseous mass of helium 3 under high pressure at the ambient temperature.

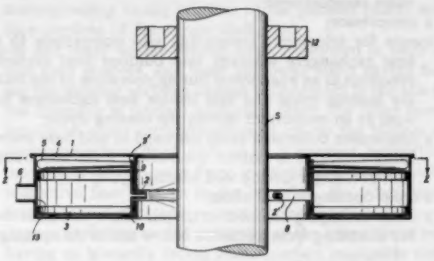
4,136,527

COOLING CONTINUOUSLY CAST INGOTS

Gert Käding, Krefeld, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Jan. 21, 1977, Ser. No. 760,932
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602941
Int. Cl.[2] F25D 17/02
U.S. Cl. 62—64 6 Claims

1. Method of cooling a continuously cast ingot as the ingot descends from a mold at a particular speed, the ingot having a surface, comprising the step of spraying water towards the surface of the ingot by means of a radially inwardly directed jet, and causing the jet to revolve about the central axis of the



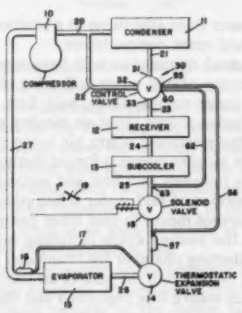
ingot at a particular speed to vary the direction of spraying in relation to the surface of the ingot.

4,136,528

REFRIGERATION SYSTEM SUBCOOLING CONTROL

Kenneth E. Vogel, Mound, and Jerome D. Powlas, Minneapolis, both of Minn., assignors to McQuay-Perfex Inc., Minneapolis, Minn.

Filed Jan. 13, 1977, Ser. No. 759,129
Int. Cl.[2] F25B 45/00
U.S. Cl. 62—174 23 Claims



1. A control system for a refrigeration system of the type including a compressor, a condenser, an expansion device, an evaporator, and interconnection means connected to form a refrigerant flow path therethrough including a liquid line connected between the condenser and the expansion device, said control system comprising means for sensing the subcooling of liquid refrigerant in the liquid line at the warmest point thereof that will assure subcooling at the expansion device, and control means connected to said subcooling sensing means and connected for controlling system head pressure in response to the sensed subcooling.

4,136,529

AIR CONDITIONING APPARATUS

William J. McCarty, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 3, 1977, Ser. No. 839,134
Int. Cl.[2] F25B 47/00; F28D 5/00; F24F 3/14
U.S. Cl. 62—280 10 Claims

1. A self-contained air conditioning unit for heating and cooling an enclosure comprising:

a chassis including a base member and a barrier dividing said chassis into an inner compartment and an outer compartment;

inner and outer heat exchangers mounted respectively in said inner and outer compartments;

an inner air moving means for recirculating enclosure air through said inner compartment;

an outer air moving means for circulating air through said outer compartment;

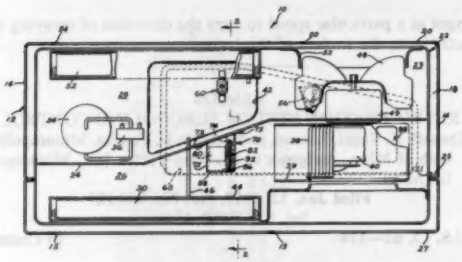
a compressor;

means for selectively connecting said compressor to said heat exchangers whereby said outdoor heat exchanger functions as an evaporator during operation of the unit on the heating cycle and said indoor heat exchanger functions as an evaporator during the cooling cycle;

a condensate collection sump disposed in said base member being arranged to collect condensate from said outdoor heat exchanger during said heating cycle;

a drain opening in said sump;

a water collecting chamber arranged below said base member extending from a position below said drain opening for



receiving water from said sump to a position underlying a portion of said inner compartment;

a first and second opening in said base member arranged over said portion of said water collecting chamber located below said inner compartment, said first opening being arranged relative to said inner air moving means so that a portion of the relatively warm air being recirculated by said inner air moving means is forced through said collecting chamber between said first and second openings and across the surface of said water when present.

condensate disposal means in said inner compartment being operable in the heating cycle including means extending into said collecting chamber for lifting and depositing said water when present into the path of air being circulated by said inner fan where it is vaporized and directed through the relatively warm inner heat exchanger.

4,136,530

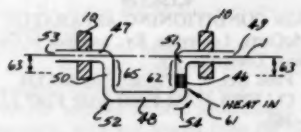
ROTARY THERMODYNAMIC APPARATUS AND METHOD

Frederick W. Kantor, 2875 Broadway, New York, N.Y. 10025

Division of Ser. No. 569,478, Apr. 18, 1975, Pat. No. 4,010,018, which is a continuation of Ser. No. 78,552, Oct. 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 864,112, Oct. 6, 1969, Pat. No. 3,808,828. This application Feb. 18, 1977, Ser. No. 770,316

Int. Cl.[2] F25B *3/00*

U.S. Cl. 62—499 **14 Claims**



1. Thermodynamic heat pump apparatus comprising a rotary inertial thermodynamic device comprising a conduit having a first section extending away from a reference line and a second section extending towards said reference line, means for pumping a fluid through said conduit, means for rotating said conduit about said reference line, means for extracting heat from the fluid in said first section and conducting heat to the fluid in said second section, and impedance control means for providing an increase in pressure drop for an increase in flow rate of said fluid in said conduit.

4,136,531

^{3}HE-^{4}HE DILUTION REFRIGERATOR

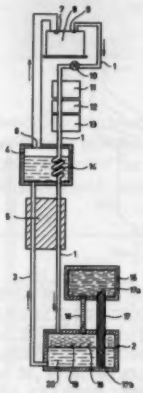
Frans A. Staas, and Adrianus P. Severijns, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 11, 1977, Ser. No. 795,879

Claims priority, application Netherlands, May 26, 1976, 7605645

Int. Cl.[2] F25B *1/00*

U.S. Cl. 62—502 **7 Claims**



1. A ^{3}He-^{4}He dilution refrigerator for producing extremely low temperatures, which comprises pump means for circulating and compressing gaseous ^{3}He, means for cooling and condensing the compressed ^{3}He, a heat exchanger for further cooling the condensed ^{3}He, a first mixing chamber for receiving the cooled condensed ^{3}He for separation into liquid concentrated ^{3}He and liquid dilute ^{3}He containing superfluid ^{4}He, a supply duct for flowing the compressed ^{3}He from said pump means through said cooling and condensing means and said heat exchanger to said first mixing chamber, a vaporization chamber for receiving liquid dilute ^{3}He from said first mixing chamber for separation of gaseous ^{3}He, a return duct for flowing liquid dilute ^{3}He from said first mixing chamber through said heat exchanger in heat-exchange relation with said supply duct to said vaporization chamber, a suction duct for flowing the gaseous ^{3}He from said vaporization chamber to said pump means, a second mixing chamber arranged at a level higher than said first mixing chamber, a communication duct having one end opening into the bottom of said second mixing chamber and its other end opening into the top of said first mixing chamber, and a superleak having one end opening into the second mixing chamber for the supply of superfluid ^{4}He thereto, the other end of said superleak opening directly into a space containing dilute ^{3}He for taking up superfluid ^{4}He from said dilute ^{3}He.

4,136,532

DRIVE SHAFT

Hiroji Okuda, Nara, Japan, assignor to Koyo Seiko Company Limited, Osaka, Japan

Filed Jul. 25, 1977, Ser. No. 819,218

Int. Cl.[2] F16D *3/06, 3/26*

U.S. Cl. 64—23 **5 Claims**

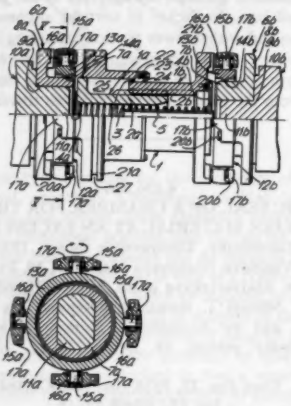
1. A drive shaft comprising:

a shaft assembly including two shaft members aligned with

and axially slidably splined to each other, the shaft members being axially biased away from each other,

two fitting yokes respectively adjacent the opposite ends of the shaft assembly toward which the shaft assembly is extensible, each of the fitting yokes having a flange and a sleeve extending from the flange toward the shaft assembly and having a center bore for fittingly receiving therein one end of a drive shaft element or of a driven shaft element in alignment with the sleeve, the fitting yoke being rotatable with the shaft element in the direction of rotation of the shaft element.

two annular joint members each surrounding the sleeve of the corresponding yoke and coaxial with the sleeve with a suitable clearance formed therebetween, each of the annular joint members having four pins extending radially outward from its outer periphery and equidistantly arranged at angular spacing of 90° about the center of the joint member, the clearance having such a dimension as to permit the displacement of the center axis of the annular joint member relative to the center axis of the sleeve during the rotation of the drive shaft, and



housings mounted on the pins on each annular joint member and freely movable in a direction allowed by the pins, the housings being arranged in opposed pairs on diametrical lines at right angles to each other, one pair of the housings being secured to a flange portion provided at the end of the shaft assembly, the other pair of the housings being secured to the flange of the fitting yoke.

4,136,533

DRIVE APPARATUS FOR ROLLING ROLLS

Hiroji Okuda, Nara, Japan, assignor to Koyo Seiko Company Limited, Osaka, Japan

Filed Jul. 28, 1977, Ser. No. 820,123

Claims priority, application Japan, May 19, 1977, 52/64639[U]

Int. Cl.[2] F16D *3/06*

U.S. Cl. 64—23 **6 Claims**

1. A drive assembly for a rolling roll comprising:

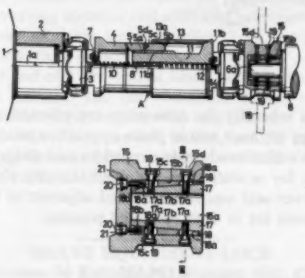
a driven shaft extending fron one end of a rolling roll axially thereof and formed on its peripheral surface with two parallel diametrically opposed planar surface portions on opposite sides of the shaft, the planar surface portions being positioned adjacent one end of the driven shaft,

an intermediate shaft,

a driven fitting yoke connected to one end of said intermediate shaft by a universal joint assembly,

a coupling connected to the other end of the intermediate shaft by another universal joint assembly and fittable to the driven shaft, the coupling having a fitting bore for releasably receiving therein the driven shaft with a loose fit, the fitting bore being provided with two flat-bottomed liner grooves of suitable width diametrically opposed to each other on opposite sides of the fitting bore and extending in an axial direction thereof in parallel to each other in corresponding facing relation to the parallel planar surface portions of the driven shaft,

inner and outer wedge-shaped liners positioned in each of said liner grooves, said inner and outer liners having facing flat slanting surfaces slanted with respect to the axis of the coupling in contact with each other, the outer liners having an outer surface positioned on the flat bottom of their respective liner groove in a manner permitting movement of the outer liner in an axial direction in its respective liner groove in the coupling, the inner liners being positioned in their respective liner grooves in superimposed relation to and inwardly of the outer liners and having an inwardly facing planar surface engagable with



one of the planar surfaces of the driven shaft and oriented parallel to the outer surfaces of the outer liners,

holding means comprising a plurality of locking bolts radially mounted on the coupling and screwed into threaded holes in the inner liners for securely holding each combination of the outer liner and inner liner in each of the liner grooves, each outer liner having axially elongated slots for passing the bolts therethrough so as to permit movement of the outer liners in an axial direction in their respective liner groove in the coupling; and

positioning means mounted in the coupling for axially moving the outer liners to consequently effect movement of the inner liners radially of the fitting bore to vary the distance between the inwardly facing surface of the inner liners and the outwardly facing surfaces of the respective outer liners.

4,136,534

KNITTING MACHINE

Carlo Villa, Via Mazzini 43 - Melzo, Milan, Italy

Filed May 11, 1977, Ser. No. 795,944

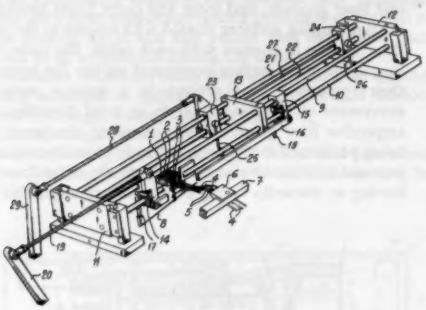
Claims priority, application Italy, May 19, 1976, 23379 A/76

Int. Cl.[2] D04B *23/00*

U.S. Cl. 66—84 A **1 Claim**

1. In a knitting machine comprising a plurality of mutally parallel hook needles which are mounted displaceably between an advanced position and a retracted position, the needles being operable to form in respective warp threads a loop chain and thereby linking with each resulting row of loops at least one weft thread which is laid over the warp threads when the needles are in their retracted position; a weft thread laying unit comprising fixed guide bar means extending transversely of the loop parallel to the direction of laying of the weft thread, said bar means including two pairs of mutually parallel bars, the two pairs being parallel to each other and one bar of each pair being arranged above the other bar of said pair; slider means mounted for reciprocating sliding movement along said bar means and including at least one respective slider mounted on each of said pair of bars for reciprocating sliding motion therealong; drive means operable to produce the reciprocating

sliding movement of the slider means and to displace the respective sliders on the respective pairs of bars in phase opposition relative to each other and including for each said slider a drive arm which is mounted for reciprocating angular movement about a pivot; means for producing the pivotal movement



of the arms whereby the two arms are pivoted through an equal angular distance and in phase opposition relative to each other; and a weft thread guide carried by said slider means and operable to lay a weft thread guided thereby along a path extending over said warp threads and adjacent to the needles when the same are in their retracted position.

4,136,535

PADDING APPARATUS FOR GOODS IN WEB-FORM

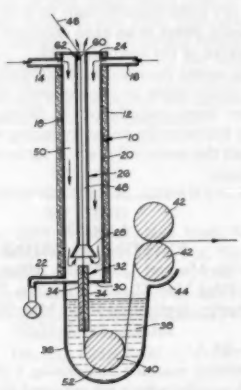
Francis G. Audas, 54 Earle Rd., Bramhall, Cheshire, England

Continuation-in-part of Ser. No. 562,792, Mar. 27, 1975, abandoned. This application Mar. 15, 1978, Ser. No. 887,074

Claims priority, application United Kingdom, Apr. 8, 1974, 15449/74

Int. Cl.[2] D06B *21/00, 23/18*

U.S. Cl. 68—5 E **3 Claims**



1. Padding apparatus for web-form goods comprising:

a bath structure and a bath of pad liquor charged thereinto,

a guide disposed within the bath for guiding the web-form goods therethrough,

a steam jacket communicating with a source of steam and having an inlet for leading steam from the source into the jacket,

the jacket being in vertical disposition upwardly of the bath and having apertured top and bottom walls,

a partition disposed within the jacket and connecting to the jacket top wall in registry with the aperture thereof and suspended downwardly from the top wall and having a primary passage extending therethrough and open at its upper end to atmosphere and open at its lower end into the jacket,

the primary passage accommodating downward movement of the web-form goods therethrough and into the jacket,

the jacket and partition cooperantly constraining steam flow through the jacket in a first flow direction downwardly and exteriorly of the partition in heat transfer relationship therewith and in a second flow direction upwardly and interiorly of the partition through the primary passage in counter direction to the downward direction of movement of the web-form goods, and

a seal having a secondary passage extending therethrough and being disposed with an upper portion extending in a sealed manner through the aperture in the jacket bottom wall and into the jacket in vertical alignment with the partition and with a lower portion extending into the bath,

the secondary passage accommodating movement of the web-form goods in an absence of air and steam in movement from the jacket into the bath and toward the guide.

4,136,536

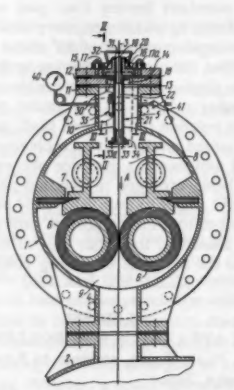
HERMETIC SEAL OF A CHAMBER FOR TREATMENT OF BANDLIKE MATERIAL AT AN EXCESS PRESSURE

Leonid G. Gorodissky, Dmitrovskoe shosse, 153/43, kv. 106; Raisa V. Vasilieva, Nizhnyaya Maslovka, 18, kv. 95; Mikhail D. Kozlov, Matveevskaya ulitsa, 1, kv. 331, all of Moscow, U.S.S.R.; Nikolai T. Romanov, deceased, late of Moscow, U.S.S.R., and by Anastasia I. Romanova, administrator, Bulatnikovsky proezd, 14, korpus 5, kv. 152, Moscow, U.S.S.R.

Filed Jan. 23, 1978, Ser. No. 871,464

Int. Cl.[2] D06B *23/18*

U.S. Cl. 68—5 E **7 Claims**

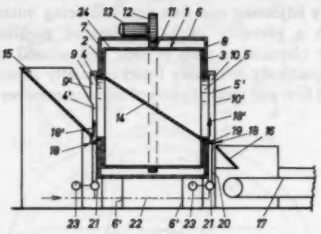


1. A hermetic seal of a chamber for treatment of bandlike material at an excess pressure, comprising: a hollow shell; a pair of driving rollers for traversing the bandlike material under treatment, said rollers being accommodated in said hollow shell; a sealing device housed in said hollow shell; and excess pressure zone within said hollow shell, said zone being located under said sealing device and communicated with the chamber; an atmospheric pressure zone defined within said hollow shell, said zone being communicated with the atmosphere and being hermetically isolated from said excess pressure zone through said sealing device along with said pair of driving rollers; a check valve mounted in said hollow shell to establish communication between said atmospheric pressure zone with the atmosphere; said check valve being fashioned as a flexible sleeve; the passageway of said flexible sleeve adapted for the bandlike material under treatment to pass freely.

4,136,537
DRUM-TYPE MACHINE FOR THE TREATMENT OF BATCHWISE TEXTILE MATERIAL

Ernst Harrsch, Marbach, Germany, assignor to Firma Gebr. Poensgen & Sulzmann GmbH, Germany

Filed Feb. 27, 1978, Ser. No. 881,857
Claims priority, application Austria, Feb. 25, 1977, 1296/77
Int. Cl.² D06F *21/04, 37/00*
U.S. Cl. 68—13 R **22 Claims**

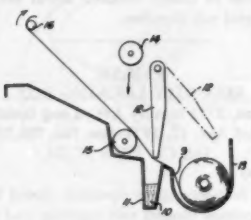


1. In a drum-type machine for the treatment of batchwise textile material, especially a washing machine, of the type having at least one driven drum rotatably supported in an approximately horizontal position and having an opening in one end wall for loading purposes and an opening in the other end wall for unloading purposes, as well as a conveying paddle in the interior for moving the batch of material in an approximately radial plane in one direction of rotation of the drum and for the axial transportation of the batch of material through the unloading aperture in the other direction of rotation of the drum, the improvement comprised in that a sensor means is provided oriented into at least the loading or unloading opening for producing an indication as a result of a batch of material moving through the respective loading or unloading aperture.

4,136,538
TREATMENT OF CONTINUOUS TOWELS

John F. Spear, Holmbury St. Mary, and Maurice C. Lemon, Reigate, both of England, assignors to Universal Towel Company, Sussex, United Kingdom

Filed Nov. 10, 1976, Ser. No. 740,490
Claims priority, application United Kingdom, Nov. 10, 1975, 46377/75
Int. Cl.² D06B *3/10, 23/00*
U.S. Cl. 68—22 R **9 Claims**



1. Apparatus for treating a roll of continuous fabric passing from a roll to a rewind mandrel forming a new treated roll which comprises:

(a) a frame;

(b) an open roll holder on said frame for catching and cradling a roll of fabric for treatment;

(c) an open bath mounted on the frame adjacent the roll holder for reception of a treating liquid and through which fabric to be treated is passed;

(d) a member pivotally mounted on the frame for immersing the fabric in the treating liquid during its passage through the bath, which member may be moved from its operative position in a lifting and pivoting movement into an inoperative position away from the bath to allow a roll of fabric to be thrown between the immersing member and the bath into the roll holder;

(e) a pair of squeeze rollers, being an upper squeeze roller and a lower squeeze roller mounted on the frame for gripping the fabric when it has passed through the bath, at least one of said rollers being driven and at least one of said rollers being movably mounted for movement from its operative position in which the fabric is gripped into an inoperative position in which the rollers are separated to allow a roll of the fabric to be thrown between said rollers into the roll holder;

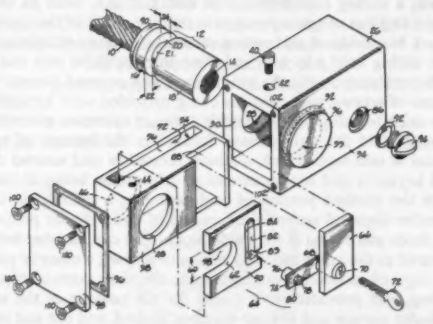
(f) a driven rewind mandrel mounted on the frame onto which the treated fabric having passed through the squeeze rollers is wound directly; and

(g) means mounted on the frame for simultaneously lifting the immersing member and effecting movement of said at least one movable squeeze roller from their operative position to their respective inoperative positions whereby the free end of a new roll of fabric may be attached to the rewind mandrel and the remainder of the roll thrown between the immersing member and bath and between the squeeze rollers into the roll holder, and for subsequently returning the immersing member and said one movable squeeze roller to their operative position.

4,136,539
HEAVY EQUIPMENT LOCK

Phillip C. Nobles, 36 Kathryn Dr., Pleasant Hill, Calif. 94523, and Mark A. Noble, 1400 Creekside Dr., Walnut Creek, Calif. 94596

Filed Jan. 12, 1978, Ser. No. 868,866
Int. Cl.² E05B *73/00*
U.S. Cl. 70—18 **9 Claims**



1. A heavy equipment lock operable by a key comprising:

a split ferrule;

an elongated shackle with said split ferrule bondingly associated to one end and defining an enlarged member at the other end;

a casing member defining an aperture for receiving said split ferrule, and an orifice for receiving a key;

a yoke member slidably disposed within the casing member and movable between a first position and a second position, the yoke member for lockingly engaging said split ferrule with said yoke member in said first position and with said split ferrule received in said aperture; and

a cam assembly disposed within the casing member and responsive to movement of a key to urge said yoke member between said first position and said second position, the cam assembly including a cam roller and cam race means in operative engagement with the cam roller, the cam race means integrally formed with the yoke member and restricting movement of the cam roller for urging

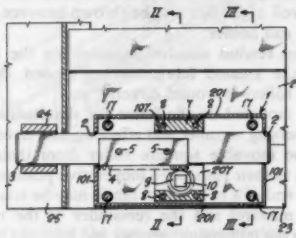
linear movement of the yoke member between the first and second position.

4,136,540

ROLLING GATES CYLINDER LOCK

Giorgio V. Coralli, and Alessandro Brunelli, both of Bologna, Italy, assignors to Viro Innocenti S.p.A., Bologna, Italy

Filed Aug. 12, 1977, Ser. No. 824,130
Int. Cl.[2] E05B *63/04*
U.S. Cl. 70—100 **1 Claim**



1. A lock comprising a casing open at its top and provided with a bottom wall, two longitudinal walls integral with said bottom wall and two side walls integral with said bottom wall and said longitudinal walls; a guide block secured by means of screws to the bottom wall of said casing; said guide block being provided with a first longitudinal slot on its side facing said bottom wall, and with a second slot on the same side and communicating with said first slot; a circular recess formed in said block on its side opposite to the said slotted side, the bottom of said recess being provided with a through passage in communication with said second slot; two apertures in the side walls of said casing in alignment with the first slot of said block; a sliding bolt disposed in said first slot, with its ends projecting out of said apertures in the side walls of the casing; a rack bar inside of said casing secured by means of screws to said sliding bolt; a lock cylinder mounted with its rear end in said circular recess in the guide block and secured thereto by means of screws, said cylinder being provided with a rotating key-operated plug provided with a square extension extending through said through passage formed in the bottom of said recess in said second slot; a pinion housed in said second slot and keyed to said square extension, said pinion being in mesh with the toothed portion of said rack bar; a cylindrical cap member disposed around the fore end of said cylinder projecting from said recess in the guide block, said cap member being secured to the guide block by means of screws; a counter plate having a plane contour conforming to the plane contour of said casing, and provided with a bore for the passage of the said cylinder portion and the cap member thereof, and nut and stud bolt means for clamping together said plate and said lock casing with interposed gate element.

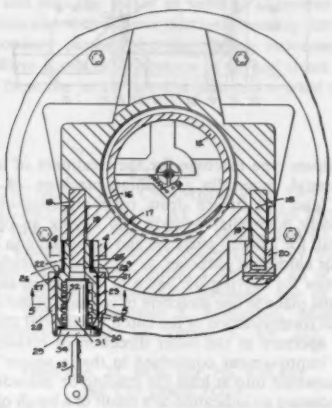
4,136,541

TAMPER PROOF LOCKING DEVICE FOR FUEL OIL METERS AND THE LIKE

Lawrence R. Gramlich, Edgewater Park, N.J., assignor to F. C. Haab Co., Inc., Philadelphia, Pa.

Filed Nov. 22, 1977, Ser. No. 853,820
Int. Cl.[2] F16B *41/00*
U.S. Cl. 70—231 **3 Claims**

1. In a meter assembly for monitoring the flow of liquid from a storage supply thereof of the type wherein the meter is operatively mounted upon a support assembly having separable parts clamped about a depending collar of the meter and wherein one of said parts is provided with a bolt member having a threaded end portion projecting through and beyond the other of said parts for attachment thereto of a securing nut, said other part being recessed in the region thereof immediately surrounding the freely projecting threaded end of said bolt member, in combination, a tamper-proof nut assembly including a nut member having an internally threaded tubular bolt-engaging first part adapted to be projected into said recessed region for threaded securement to said projecting end portion of said bolt and a tubular second part of enlarged diameter integral with and extending axially from said first part, said axially extending second part having a polygonally shaped external surface for application of a wrench or like nut-turning tool thereto terminating in an annular shoulder immediately adjoining said first part and being internally provided with a plurality of axially spaced parallel annular grooves or channels, a pair of first and second cylindrical sleeves respectively revolubly fitted in axially separated relation on said first and second parts of said nut member, said first



cylindrical sleeve fitted on said internally threaded bolt-engaging part of said nut member being of an external diameter so substantially smaller than that of said second sleeve as to enable it to be closely confined in said recessed region of said meter support assembly whereby to effectively preclude access thereto of a crimping tool or the like for binding said first sleeve on said bolt-engaging part of said nut member, and a key-actuated tumbler cylinder removably fitted within the bore of said internally grooved part of said nut member having spring-pressed tumbler elements adapted to project into said grooves or channels automatically upon retraction of the key from said tumbler cylinder whereby to retain said second sleeve in position to freely revolve about said polygonally shaped part of said nut member.

4,136,542

SECURITY LOCKING BOX

Allen M. Robison, 3731 Stevely Ave., Long Beach, Calif. 90808

Filed Apr. 12, 1977, Ser. No. 786,759
Int. Cl.[2] E05B *37/20*
U.S. Cl. 70—290 **9 Claims**

1. A locking box having an opening closed by a cover secureable in a position closing said opening and a lock mechanism requiring movement through an enabling combination of a plurality of preselected, sequential positions which comprises:

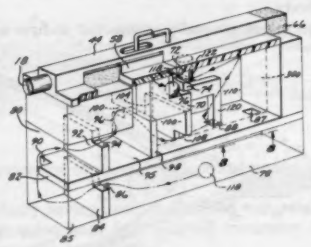
a retainer member carried on the inside wall of said cover;

a latch member carried by said box and moveable between a first position capturing said retainer member and a second position releasing said retainer member;

latch actuation means including an actuation member and a ball member received in an actuation cavity to operatively interconnect said actuation member and said latch member;

labyrinth means received within said box and accessible only through said opening including a plurality of ball receiv-

ing channels formed by at least one chamber subdivided by a plurality of transverse partitions having ball passing apertures at diverse locations to define a continuous, three dimensional torturous passageway having cross passageways at mutually perpendicular orientations with at least one of said transverse partitions being removeably received in said chamber thereby permitting fixed adjustability of said latch enabling combinations; and



a ball obstruction in said passageway and means interconnected with said actuation means and operative to remove said ball obstruction and permit ball access through said passageway.

4,136,543

SKEW ROLLING MILL

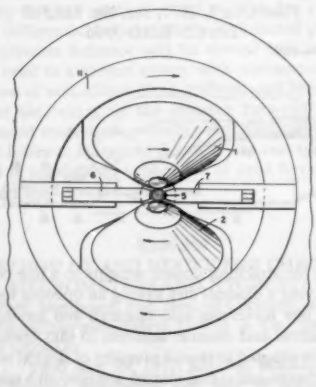
Eckhard Tuschy, and Georg Wischmeyer, both of Osnabruck, Germany, assignors to Kabel-und Metallwerke Gutehoffnungshuette AG, Germany

Filed Mar. 20, 1978, Ser. No. 888,203

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1977, 2712244

Int. Cl.² B21B *13/20*

U.S. Cl. 72—78 **5 Claims**



1. In a skew rolling mill including a rotating roller carrier which rotates about the axis of a stock to be rolled and carries rotating working rollers in contact with the stock which rotate about an axis inclined to and which intersects with the axis of the stock, the improvement comprising:

said roller carrier carrying only two working rollers spaced from each other by about 180° and restraining means positioned between the working rollers to restrain lateral bending of the stock.

4,136,544

COOLING TUBES FOR WIRE STOCKS

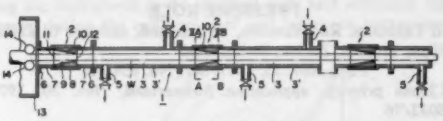
Yamada Masahiko, Yokosuka, Japan, assignor to Showa Electric Wire & Cable Co., Ltd., Kawasaki, Japan

Filed Aug. 31, 1977, Ser. No. 829,372

Claims priority, application Japan, Aug. 31, 1976, 51-104164

Int. Cl.² B21B *45/02*; C21D *1/64*

U.S. Cl. 72—201 **3 Claims**



1. In a cooling tube arrangement for a hot rolled wire stock of the type wherein the cooling tube is divided into a plurality of cooling sections by spaced apart partition members, each partition member having an opening for the passage of the wire stock, and each cooling section being provided with inlet and outlet for cooling liquid, the improvement which comprises each partition member comprising a nozzle-like rotary member having an axial passage for passage of the wire stock, the inlet opening of each passage being circular and having an inlet diameter slightly larger than the major axis of the rolled wire stock entering said passage and the outlet opening of each passage having an oval shape having a major axis equal to the diameter of the inlet opening of said passage and a minor axis slightly larger than the minimum diameter of the wire stock passing therethrough and wherein the cross-sectional configuration of each passage gradually changes from its inlet opening to its outlet opening in the axial direction of said passage.

4,136,545

ROLLING MILL STAND

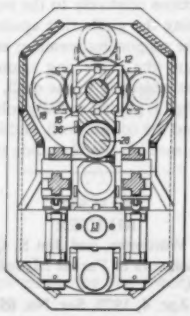
Alexander I. Wilson, Sheffield, England, assignor to Hille Engineering Company Limited, Yorkshire, England

Filed Jun. 28, 1977, Ser. No. 810,734

Claims priority, application United Kingdom, Jun. 29, 1976, 27020/76

Int. Cl.² B21B *31/14*

U.S. Cl. 72—238 **8 Claims**



1. A rolling mill stand comprising:

a stand housing, having a pair of eccentric shafts journalled therein,

a pair of rotatable mountings each supported by one of said eccentric shafts, the mountings being located on opposite sides of the stand pass line,

a drive shaft supported by each of said eccentric shafts,

each rotatable mounting having at least two fitments equally spaced from the axis of rotation of the mounting, each fitment being adapted to support a roll assembly, and

coupling means for coupling each of the drive shafts with a roll assembly at its operative rolling position, whereby the rotation of the eccentric shafts adjusts the roll gap and rotation of each mounting brings the fitments in turn to a given position in which the roll assembly carried by that fitment is in the rolling position.

4,136,546

PRESSURE ROLL

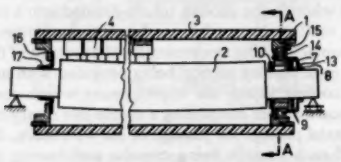
Rolf Lehmann, Rudolfstetten, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Nov. 23, 1977, Ser. No. 854,346

Claims priority, application Switzerland, Nov. 30, 1976, 015032/76

Int. Cl.² B21B *13/02*

U.S. Cl. 72—241 **10 Claims**



1. A roll unit including

a. a pressure equalization roll and at least one counter-roll which coacts with the equalization roll to define a press gap,

b. the equalization roll comprising a stationary axial supporting member, a series of hydrostatic supporting elements mounted in the supporting member and arranged in a row which extends along the press gap, and a shell which rotates about the supporting member and is supported thereon via the hydrostatic supporting elements,

c. the shell being free to move in all radial directions relatively to the supporting member, and the supporting elements being radially displaceable so that they follow radial movements of the shell,

d. the equalization roll also including at least one guide ring which surrounds the supporting member and is interposed between that member and the shell, said ring containing a central aperture dimensioned to permit the ring to move in all radial directions relatively to the supporting member;

e. means restraining the guide ring against axial movement relatively to the supporting member; and

f. means restraining the guide ring against both radial and axial movement relatively to the shell,

g. whereby the shell is guided radially solely by the supporting elements and the counter-roll, and is guided axially by the supporting member via the guide ring.

4,136,547

RIVETER

John F. Ewig, Jr., Worcester, and Jon S. Gardner, Marlboro, both of Mass., assignors to Parker Manufacturing Company, Worcester, Mass.

Filed Apr. 4, 1978, Ser. No. 893,354

Int. Cl.² B21J *15/34*

U.S. Cl. 72—391 **10 Claims**

1. A riveting tool for use with a hollow rivet having a mandrel, comprising:

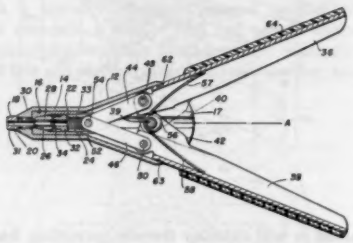
(a) a main body having an elongated barrel which contains a bore,

(b) a pulling device movable within said bore and including jaws, the foremost position of the pulling device being determined by abutment with a portion of the body of the tool, the jaws being adapted to be opened in their foremost position to permit release or insertion of a mandrel therebetween, and adapted when moved from said foremost position to a rearmost position to grip and pull the mandrel of an inserted hollow rivet,

(c) a first lever, one end of which is pivotally connected to the body and the other end of which extends rearwardly of the body,

(d) a second lever, one end which is pivotally connected to the body and the other end of which extends rearwardly of the body,

(e) linkage means pivotally connected at first and second



points to the first and second levers, respectively, and to the pulling device at a third point, said first and second points being spaced from the pivotal connection of each lever on the body so that divergence of the extending ends of the levers causes the pulling device to move toward said rearmost position and convergence of said extending ends causes the pulling device to move toward said foremost position, and

(f) means for biasing the levers so that the rearwardly extending portions of said levers diverge.

4,136,548

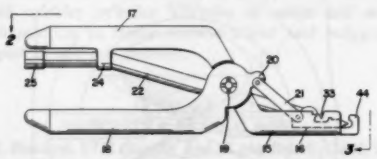
TOOL FOR ATTACHING WEIGHTS TO FISHING LINE

William L. Dippold, St. Marys, Pa., assignor to Elafuss, Inc., St. Marys, Pa.

Filed Oct. 5, 1977, Ser. No. 839,518

Int. Cl.² B21D *7/06*

U.S. Cl. 72—409 **8 Claims**



1. A tool for attaching slotted weights to a line comprising:

a base having a channel and having an opening for insertion of the line traversing said channel, and having an abutment across said channel adjacent to said opening;

a reservoir adapted to store a plurality of slotted weights and to discharge individual slotted weights into said channel, said reservoir extending perpendicularly from and communicating with said channel, said reservoir being generally tubular with a single flat interior side for maintaining in proper alignment a plurality of generally cylindrical weights having a flat surface opposite the slot;

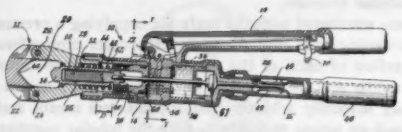
a transfer block slidable within said channel, said block adapted to urge a slotted weight discharged from said reservoir against said abutment to close the slot and attach the weight to the line; and

means for moving said transfer block within said channel.

4,136,549
ELECTRICAL CABLE CONNECTOR TOOL

Thomas G. Lytle, and Alajos Z. Bauer, both of Norwalk, Conn., assignors to Burndy Corporation, Norwalk, Conn.

Filed Jan. 16, 1978, Ser. No. 869,405
Int. Cl.[2] H01R *43/04*
U.S. Cl. 72—453.16 28 Claims



1. A device for compressing electrical connectors comprising

a main body having positionally fixed with respect thereto a compression head for receiving connector bodies to be subjected to compression,

a compression indentor positioned within an aperture forming the connector receiving portion of said compression head, said indentor being located at the end of an associated sleeve which is interconnected to one end of an axially movable, rotatable shaft which has two intermediate, axially displaced threaded portions, the threads of which are oriented in the same direction, the lead of the threads of the first threaded portion closest to the head being greater than those of the other threaded portion and being threadedly interengaged with corresponding threads in said associated sleeve, said sleeve being positioned fixed with respect to said main body against rotation when said shaft is rotated, the other of said threaded portions being threadedly interengaged with corresponding threads of a pillow block which surrounds and is coaxial with said shaft, said pillow block being positionally fixed with respect to said main body against rotating when said shaft is rotated, said pillow block being normally biased against axial movement in the direction of said head by bias means and including stop means cooperatively interengageable with corresponding stop means positionally fixed with respect to said head so as to limit the distance by which said pillow block can move axially in the direction of said head,

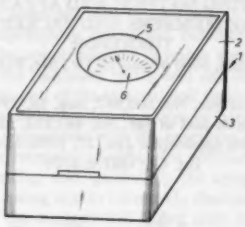
whereby through rotation of said shaft, and as a result of the lead differential between the said threaded portions, said compression indentor will be moved into said compression head to a desired extent, with corresponding relative motion of said pillow block towards said head and consequent shortening of the distance between both of the aforesaid stop means reducing the distance by which said shaft is free to move said indentor into said aperture of said head in response to application of axial force movements to said shaft toward said head.

4,136,550
METHOD OF AND DEVICE FOR CHECKING HYGROMETERS AND HYGROSTATS

Otto F. Pott, Nurtingen, Fed. Rep. of Germany, assignor to G. Lufft Metallbarometerfabrik GmbH & Co., Stuttgart, Fed. Rep. of Germany

Filed Aug. 29, 1977, Ser. No. 828,612
Claims priority, application Fed. Rep. of Germany, Sep. 4, 1976, 2639958
Int. Cl.[2] G01W *1/18*
U.S. Cl. 73—1 G 24 Claims

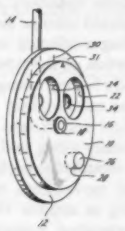
24. A method of checking calibration of instruments used for relative humidity purposes including a hygrometer and a hygrostat, comprising in combination the steps of: checking the instrument to be checked by a reference instrument of the same type operable to directly indicate the air humidity and confined in an insulation medium to maintain a constant temperature, calibrating said reference instrument by means of a corresponding saturated solution associated with said reference instrument in said insulation medium to a standard climate corresponding to the operational climate with regard to the relative humidity, maintaining said reference instrument and said saturated solution in said insulation and subsequently at the place of mounting of the instrument to be checked exposing said reference instrument together with the hygrometer to be checked to the same conditions, and after the reference instrument has been adapted to the operational conditions, equalizing the instrument to be checked with said reference instrument, during the calibration of said reference instrument exposing the latter to the standard climate created by said solution while during said calibration insulating said reference instrument with regard to its surrounding, following the equalization of the instrument to be checked again exposing said reference instrument to the standard climate created by said solution and confined in said insulation medium, said solution being selected from the group consisting of lithium chloride for a standard climate with a 12% relative humidity, sodium bichromate for a standard climate with a 52% relative humidity, sodium chloride for a standard climate with a 75.5% relative humidity, and barium chloride for a standard climate with a 90% relative humidity.



4,136,551
DENSIMETER

Klaus Lunstroth, 4746 Pease St., Houston, Tex. 77023

Filed May 20, 1976, Ser. No. 688,266
Int. Cl.[2] G01N *9/10*
U.S. Cl. 73—32 R 19 Claims



1. A device for measuring the specific gravity of a fluid comprising

a shaft,

a disk having a non-interrupted outer periphery and an axis and being rotatably mounted to said shaft through said axis,

a first means for displacing the center of buoyancy of said disk from said axis,

a second and non-protuberant means for displacing the center of gravity of said disk from both said center of buoyancy and said axis, and

scale and indicator means associated with said disk for reading its angular displacement from a reference position,

said second means including both weight means for altering

the mass distribution of said disk and temperature compensation means for altering the center of gravity of the disk to compensate for changes in temperature of the fluid, and

said disk further having means for compensating for the angular position of the disk on the shaft to maintain the change in density with respect to the change in angular position substantially constant over a typical range of fluid specific gravity.

4,136,552

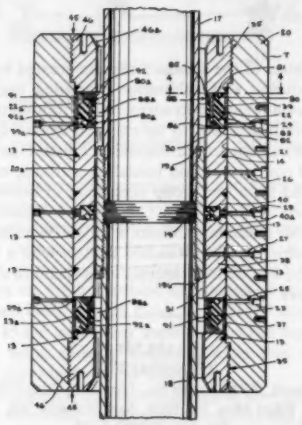
LEAK TESTING METHOD AND APPARATUS FOR TUBULAR MEMBERS AND PACKER MEANS THEREFOR

Malvern M. Hasha, 5400 Memorial Dr., Ste. 813, Houston, Tex. 77007

Continuation of Ser. No. 506,547, Sep. 16, 1974, which is a continuation-in-part of Ser. No. 467,133, May 6, 1974, abandoned. This application Jan. 27, 1978, Ser. No. 873,003

Int. Cl.[2] G01M *3/04*

U.S. Cl. 73—46 **3 Claims**



1. A testing apparatus for repetitively performing external tests for leaks in tubular members, such as, connections between two interconnected tubular members, comprising:

a body for encircling a selected length of tubular member including the portion of the tubular member to be tested for leaks, said body having a longitudinal opening through which the tubular member may extend;

the body having first and second annular grooves therein spaced longitudinally along said opening;

annular seal means mounted in each groove for inwardly and outwardly radial movements, each of the annular seal means comprising an annular elastomer body having an inner surface extending generally toward the tubular member to be sealingly engaged and having an outer circumferential surface for receiving fluid pressure, the inner surface including two opposing sloping surfaces which taper inwardly to a surface which physically engages the tubular member when the annular seal means is moved radially inwardly;

back-up means mounted in association with each annular seal means for inward and outward radial movement with such seal means, the back-up means for each annular seal means comprising a plurality of anti-extrusion elements mounted on the upper inner portion and on the lower inner portion of the annular seal means so as to be simultaneously movable therewith in a radial direction and so as to form a substantially circular ring on each of the upper inner portion and the lower inner portion of the annular seal means when the annular seal means and the back-up means engage the tubular member;

each of the plurality of anti-extrusion elements forming the back-up means having a first surface for extending toward the tubular member to be sealingly engaged and having a second sloping surface for engaging the sloping surface of the annular seal means which tapers inwardly toward the tubular member;

means associated with the body for supplying a pressurized actuating fluid directly against the outer circumferential surface of each of the annular seal means to force the annular seal means and its associated back-up means radially inwardly whereby the annular seal means and the back-up means sealingly engage the tubular member at a selected position, the spaced annular seal means and the body forming a closed chamber which seals off the exterior of the tubular member and the portion of the tubular member to be tested, and the sloping surfaces of the annular seal means and the sloping surfaces of the anti-extrusion elements of the back-up means coacting to urge the anti-extrusion elements into tighter frictional engagement with the tubular member upon the application of additional pressurized actuating fluid after the annular seal means have moved into sealing engagement with the tubular member;

means for supplying a pressurized test fluid into the closed chamber for externally testing the selected portion of the tubular member enclosed in the closed chamber; and

means for measuring any decline of the pressure of the testing fluid occurring in the closed chamber, which decline is indicative of a leak in the tubular member.

4,136,553

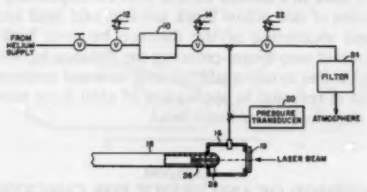
METHOD FOR VERIFYING THE PRESSURE IN A NUCLEAR REACTOR FUEL ROD

William J. Jones, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 8, 1977, Ser. No. 831,460

Int. Cl.[2] G01L *19/00*

U.S. Cl. 73—52 **4 Claims**



1. The method of verifying gas pressure in a nuclear reactor fuel rod comprising the steps of:

placing an end of a sealed fuel rod charged with a gas to a predetermined nominal pressure in a drill chamber;

placing said drill chamber under atmospheric pressure;

charging a ballast chamber connected with said drill chamber to a pressure greater than the nominal pressure,

piercing the end of said rod to permit the gas therein to flow into said drill chamber;

discharging the gas pressure from said ballast chamber into said drill chamber; and

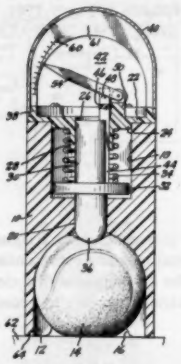
comparing the deviation of the combined pressure then in the drill chamber from nominal to determine the degree of charge in said fuel rod.

4,136,554

TESTER FOR INFLATED ITEMS

Raymond B. Larson, South Bend, Ind., assignor to Wells Electronics, Inc., South Bend, Ind.

Filed Oct. 31, 1977, Ser. No. 847,228
Int. Cl.[2] G01N *3/48*
U.S. Cl. 73—81 9 Claims



1. A device for testing the pressure of inflated objects comprising

a housing having a test chamber formed in one end thereof and adapted to receive an inflated object to be tested, said end adapted to bear upon a supporting member, the depth of said chamber being not greater than a dimension of said object,

a spring pressed plunger slidable in said housing and normally positioned to project into said test chamber toward said supporting member, and

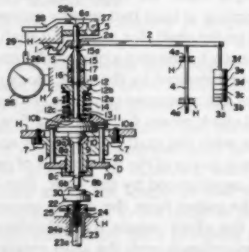
means for measuring the displacement of said plunger from normal position incident to compressive deformation of said object within the confines of said test chamber between said plunger and said supporting member when the chambered end of said housing engages said supporting member.

4,136,555

REFERENCE-LOAD VARIABLE HARDNESS TESTER

Shozo Iwasaki, Ebina, Japan, assignor to Kabushiki Kaisha Akashi Seisakusho, Japan

Filed May 11, 1977, Ser. No. 795,969
Claims priority, application Japan, Jun. 28, 1976, 51-76181
Int. Cl.[2] G01N *3/44*
U.S. Cl. 73—83 1 Claim



1. A variable reference load hardness tester, comprising;

a supporting and guide frame;

a load shaft movably supported by the frame, having an indenter at a first end and having, between the indenter and a second end, a flared portion of the shaft, outwardly extending therefrom;

a receiving member rigidly supported by the frame, surrounding the shaft adjacent the shaft adjacent the flared portion, having, remotely from the indenter, a relatively wide portion, and having, closer to the indenter, a relatively narrow portion, the wide portion having apertures extending along the shaft;

a spring and seat system for variable application of reference loads, comprising, a spring seat secured to the shaft to be stationary relative thereto, a counter-seat slidably fitted on the shaft opposite the stationary seat and having means for receiving a reference load from adjacent the second end of the shaft, an internal and an external coil spring, both coaxial with the shaft, for variable independent application of the reference load to the shaft, the internal spring being compressedly interposed between the stationary seat and the counter-seat, a movable spring seat engageable with the stationary spring seat and having means for receiving an end of the external coil spring for use of both coil springs in measuring one type of hardness;

drive means engageable with the apertures in the wide portion of the receiving member for returnably spacing the movable spring seat, guided by the apertures, from the stationary spring seat to returnably disengage it therefrom for use of the internal coil spring only in measuring another type of hardness; the drive means being directly, threadedly connected with the narrow portion of the receiving member, for thread-guided movement along the same;

the drive means comprising a discoidal operating member threadedly engageable with the narrow portion of the receiving member; and a plurality of slide bars secured to and upstanding from the operating member for sliding motion through the wide portion of the receiving member and for pushing engagement with the movable spring seat;

the receiving member having vertical holes receptive of the slide bars; and

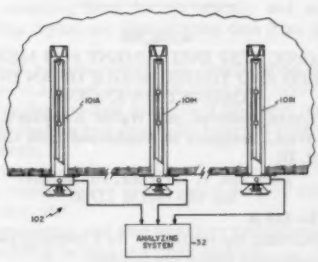
a stop screwed onto the narrow portion of the receiving member below the operating member to prevent the operating member from dropping and limit downward adjustment of said operating member.

4,136,556

DEVICE TO MONITOR MOVEMENT OF A SURFACE

Glenn A. Graham, Lexington, Ky., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jan. 11, 1978, Ser. No. 868,596
Int. Cl.[2] G01N *33/24*
U.S. Cl. 340—690 11 Claims



1. A device to monitor movement of a surface that comprises, in combination: an expansion anchor that is inserted into the bulk of the material behind the surface to be monitored to reach a stable stratum therein; a creep-resistant, force-generating, elongate member; an anchor block to rest against the surface whose movement is to be monitored; the expansion anchor being secured to one end of the elongate member and the anchor block being attached to the other end of the elongate member so that said elongate member is in tension between the two; and means to denote if the tension of the elon-

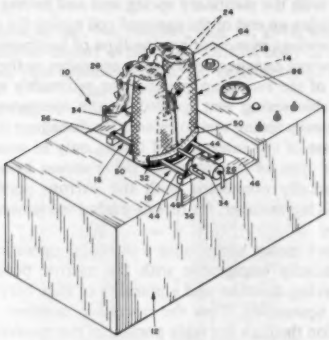
gate member exceeds some predetermined amount, the creep-resistant, force-generating elongate member being operable to measure velocity or creep rate of movement of said surface and the tension on the elongate member being a function of said velocity.

4,136,557

PANTY HOSE TESTING APPARATUS AND METHOD

Cecil R. Bell, Jr., Pinnacle, and Walter R. Sizemore, Winston-Salem, both of N.C., assignors to Hanes Corporation, Winston-Salem, N.C.

Filed Jan. 19, 1978, Ser. No. 871,086
Int. Cl.[2] G01N *3/00*
U.S. Cl. 73—816 **10 Claims**



1. In an apparatus for testing the resistance to fabric or seam damage to panty hose garments and the like; a manikin having an external configuration substantially conforming to the lower portion of a human torso and including waist, hip, and leg portions, crotch means including a crotch member intermediate the leg portions, said crotch member normally positioned in substantially abutting relation with said manikin, means adjacent said manikin waist portions for applying a force to a garment for firmly holding a garment upon said manikin, and means for selectively applying a force to said crotch means to displace said crotch member relative to said leg portions and against the crotch portion of a garment sufficiently to initiate a tear or seam damage to the garment material, and means for recording the force applied by said crotch means sufficient to initate seam or fabric damage of the garment.

4,136,558

ELECTRONIC TEST INSTRUMENT FOR MEASURING THE SPEED AND TIMING ANGLE OF AN INTERNAL COMBUSTION ENGINE

Henry J. Lukes, Bellevue, and Walter Kamphorst, Redmond, both of Wash., assignors to Sundstrand Data Control, Inc., Rockford, Ill.

Filed Jun. 7, 1977, Ser. No. 805,247
Int. Cl.[2] G01M *15/00*
U.S. Cl. 73—119 A **60 Claims**

1. An electronic test instrument for a rotating, piston driven internal combustion engine comprising:

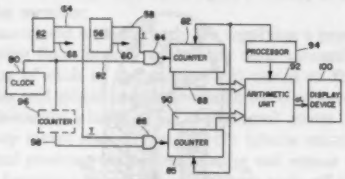
means for generating a signal representing the time of occurrence of a firing event in the engine;

means for generating a position signal representing the time a predetermined piston in the engine arrives at a predetermined point within a cylinder;

means responsive to said firing event signal and said position signal for generating a t pulse signal wherein said t pulse signal has a pulse width proportional to t the time duration from said firing event to the time said piston reaches said predetermined point within the cylinder;

means for generating a T pulse signal wherein said T pulse signal has a pulse width proportional to T the time of rotation of the engine;

first means for converting said t signal pulse width into a first electrical quantity representing t;



second means for converting said T signal pulse width into a second electrical quantity representing T; and

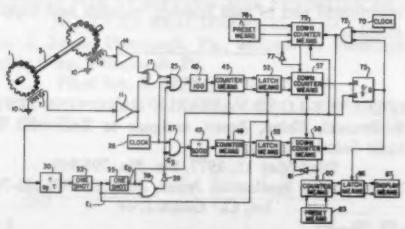
electronic means for dividing said first electrical quantity by said second electrical quantity to generate a timing angle signal.

4,136,559

TORQUE METER MEANS

Winthrop K. Brown, Bellaire, Tex., assignor to Texaco, Inc., New York, N.Y.

Filed May 5, 1977, Ser. No. 794,285
Int. Cl.[2] G01L *3/10*
U.S. Cl. 73—136 A **8 Claims**



1. A torque meter for measuring the torque of a rotating shaft comprising at least two sensing means, portions of which are affixed to the shaft, for providing shaft pulse signals at the same frequency but having a phase difference corresponding to the torque experienced by the shaft, clock means for providing clock pulses, circuit means connected to the two sensing means and to said clock means for providing first groups of pulses in accordance with the shaft pulse signals so that the number of pulses in each group of the first groups of pulses corresponds to the torque experienced by the shaft, first counting means for counting the pulses from the circuit means, pulse means connected to the clock means for providing second groups of pulses in accordance with the shaft rotation; second counting means connected to the pulse means for counting the pulses from the pulse means, control pulse means connected to both counting means for resetting the counting means each revolution of the shaft, and ratio means connected to both counting means for averaging out errors due to the shaft rotation and providing an output corresponding to the torque experienced by the shaft in accordance with the ratio of the counts in the counting means.

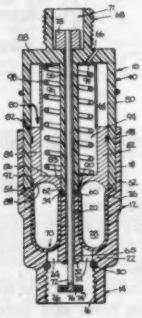
4,136,560
PRESSURE GAUGE

Alexander T. Gellos, 144-36 29th Ave., Flushing, N.Y. 11354

Continuation-in-part of Ser. No. 754,514, Dec. 27, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,899, Jun. 30, 1975, abandoned, which is a continuation-in-part of Ser. No. 464,239, Apr. 25, 1974, abandoned. This application Dec. 9, 1977, Ser. No. 859,015

Int. Cl.[2] B60C *23/00;* G01L *7/16*

U.S. Cl. 73—146.8 35 Claims



1. A gauge for measuring the pressure of an inflatable device having a valve stem which comprises:

(a) means for forming a first enclosure;

(b) means for forming an airtight enclosure of variable volume within said first enclosure;

(c) means for affixing said gauage to the valve stem;

(d) means for coacting with the valve stem to release the pressurized gas within the inflatable device into said airtight enclosure, said releasing means also adapted to respond to device inflating means to thereby cause the device to be inflated;

(e) means for controlling the variation of the volume of said airtight enclosure such that said variation is proportional to the pressure of the gas; and

(f) means for indicating said variation in response to the pressurized gas to thereby give a measure of the pressure of the gas, said indicating means including,

(i) an annular band adapted to move axially in response to the variations of the volume of said airtight enclosure;

(ii) a transparent housing comprising that portion of said first enclosure wherein said annular band moves;

(iii) at least one grouping of numerals, each grouping extending axially along the length of said transparent housing and corresponding to the range of pressures to be measured by said gauge, each grouping positioned radially about the perimeter of said transparent housing a predetermined distance from another grouping;

(iv) at least one grouping of serrations, each of said latter groupings extending axially along the length of said transparent housing; and

(v) an indicator ring, adaptable to move axially along the length of said transparent housing and adapted to cooperate with said serrations to thereby be restrained against unintended axial movement.

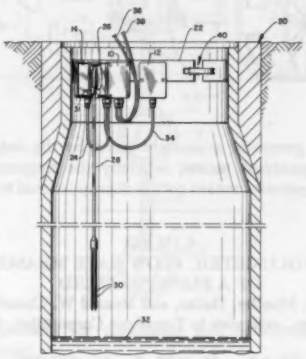
4,136,561
APPARATUS FOR AUTOMATICALLY SENSING AND RECORDING DATA IN A SEWAGE SYSTEM

Frederick N. Mueller, Dallas, and Ronald W. Chandler, Plano, both of Tex., assignors to Tetradyne Corporation, Carrollton, Tex.

Filed Jun. 6, 1977, Ser. No. 803,773

Int. Cl.[2] G01F *23/04;* G01W *1/14;* G01D *11/24*

U.S. Cl. 73—171 16 Claims



1. An automatic data acquisition system for recording data in a sewage system comprising:

a control module including circuitry for generating control signals and for receiving digital data and further including a plurality of input terminals,

a plurality of sensor modules each including means for sensing a different physical characteristic of the sewage system, each of said sensor modules including means for being removably connected to one of said input terminals and operable in response to said control signals for inputting digital data representative of the sensed physical characteristics to said control module along with identification data identifying the source of said digital data,

a first one of said sensor modules sensing the level of water in a portion of the sewage system,

a second one of said sensor modules sensing the amount of rainfall in the area of the sewage system,

a recorder module including means for being removably connected to one of said input terminals and including a removable recording cassette, said recorder module having a recording head for periodically and sequentially recording digital and identification data from said sensor modules,

said control module periodically interrogating said sensor modules in a preset sequential order and receiving digital and identification data transmitted from said sensor modules and causing said data to be recorded on said recording cassette,

clock means in said control module for generating time signals representative of the day of the year and the time of the day, and

means transmitting said time signals to said recorder module for recording on said recording cassette.

4,136,562
AUDIBLE SPEED INDICATOR FOR HANG GLIDER

Stephen M. Crooker, 28 Mechanic St., Lebanon, N.H. 03766

Filed Feb. 3, 1978, Ser. No. 875,067

Int. Cl.[2] G01C *21/10*

U.S. Cl. 73—187 9 Claims

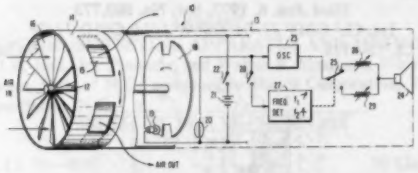
1. An audible speed indicator for a movable vehicle, such as a hang glider or the like, comprising:

(a) a housing adapted to be mounted to the vehicle,

(b) an impeller rotatably mounted in the housing,

(c) means for varying the passage of air through the impeller to thereby adjust the air speed at which the impeller will commence rotation,

(d) electrical pulse generator means driven by the impeller, and



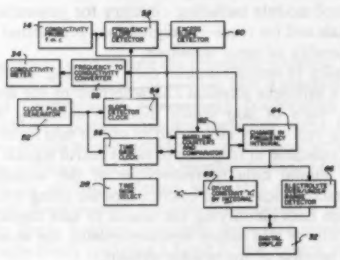
(e) audio generator means energized by the output of the pulse generator means, whereby the frequency of the audio generator means output is proportional to air speed.

4,136,563

DIGITAL VOLUMETRIC FLOW RATE MEASUREMENT OF A FLOWING FLUID

Frederick N. Mueller, Dallas, and Ronald W. Chandler, Plano, both of Tex., assignors to Tetradyne Corporation, Carrollton, Tex.

Filed Sep. 30, 1977, Ser. No. 838,082
Int. Cl.[2] G01F *1/70*
U.S. Cl. 73—194 E **26 Claims**



1. A method for measuring the volumetric rate of flow of a flowing fluid, comprising:

placing a conductivity probe into the flowing fluid, said probe having an oscillator with a frequency proportional to the conductivity of the fluid,

determining the base line conductivity of the fluid,

introducing a predetermined quantity of a known electrolyte material into the flowing fluid at a point upstream from the conductivity probe,

determining a flow rate constant based on the number of equivalents of the known electrolyte introduced into the flowing fluid,

accumulating the base line conductivity as measured by the frequency of the output signal of the oscillator for a predetermined period of time,

determining the integral of the fluid conductivity caused by the electrolyte and the fluid for said predetermined period of time,

automatically subtracting the accumulation of the base line conductivity from said integral of the fluid conductivity for said predetermined period of time such that said integral of change of conductivity which is caused solely by the electrolyte material for said period of time is determined,

dividing said flow rate constant by said integral of the change of conductivity caused by the electrolyte for calculating the volumetric flow rate of the fluid, and

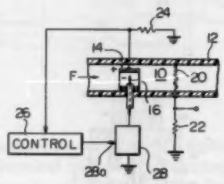
displaying the calculated volumetric flow rate.

4,136,564

MASS FLOW RATE DETECTOR OF ELECTROSTATIC TYPE

Suzuo Suzuki, Yokosuka; Yoshihisa Kawamura, Fujisawa, and Mitsuhiko Ezoe, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 17, 1978, Ser. No. 878,900
Claims priority, application Japan, May 2, 1977, 52/51360
Int. Cl.[2] G01F *1/56*
U.S. Cl. 73—194 F **7 Claims**



1. A device for measuring mass flow rate of a fluid in a fluid passage, comprising:

a set of corona discharge electrodes spaced and disposed in a section of said fluid passage;

a power supply for applying a high voltage to said electrodes to make corona discharge across said electrodes thereby to partially ionize said fluid;

an ion detection electrode disposed in said fluid passage at a distance downstream from said corona discharge electrodes;

an output producing means for producing an electrical output representing the amount of ions collected by said ion detection electrode; and

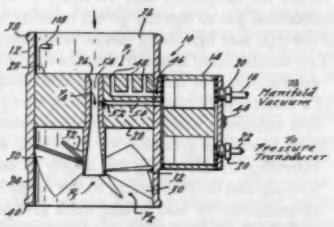
a control means for regulating the output voltage of said power supply so as to maintain the intensity of a discharge current flowing between said corona discharge electrodes constant, whereby the formation of ions by said corona discharge is not influenced by fluctuation in the density of said fluid while said amount of ions becomes a function of the product of said density and the volume flow rate of said fluid.

4,136,565

VARIABLE GEOMETRY FLUID FLOWMETER

Robert S. Migrin, and Jerry A. Olson, both of Dearborn, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 20, 1978, Ser. No. 898,267
Int. Cl.[2] G01F *1/44, 1/46*
U.S. Cl. 73—212 **23 Claims**

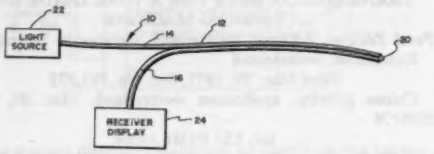


1. In a flowmeter of the type including means for swirling a fluid flowing in a passage to create a low pressure region at the center of said swirl, means for sensing said low pressure, and means for sensing the pressure of said fluid before said swirling, the improvement wherein said swirling means comprises:

means operative to increase the rate of said swirl in response to increasing fluid flow through said passage; and

means operative to decrease the rate of such increase in response to such increasing fluid flow.

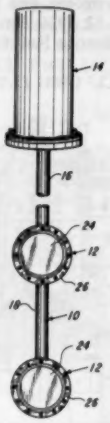
4,136,566
SEMICONDUCTOR TEMPERATURE SENSOR
Douglas A. Christensen, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah
Filed Jun. 24, 1977, Ser. No. 809,593
Int. Cl.[2] G01K *11/18*
U.S. Cl. 73—356 **8 Claims**



1. A temperature sensor comprising in combination:
a radiant energy path means comprising a first optical fiber waveguide means and a second optical fiber waveguide means;
sensing means prismatically configurated so as to provide a direct reflective path from said first waveguide means, through said sensing means, to said second waveguide means, said sensing means being fabricated from material which absorbs a portion of a monochromatic radiant energy transmitted along said direct reflective path through said sensing means as a function of temperature;
a monochromatic radiant energy source means optically coupled to said first optical fiber waveguide means, thereby introducing said monochromatic radiant energy into said first optical fiber waveguide means; and
detecting means optically coupled to said second optical fiber waveguide means for detecting the intensity of the monochromatic radiant energy transmitted along said direct reflective path through said sensing means, the detecting means correlating the intensity of the transmitted monochromatic radiant energy with the temperature of the sensing means.

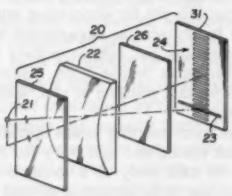
4,136,567
PULP DENSITY METER
Frank Rosenblum, Ville Saint Laurent, Canada, assignor to Noranda Mines Limited, Toronto, Canada
Filed Oct. 15, 1976, Ser. No. 732,864
Claims priority, application Canada, Jul. 5, 1976, 256295
Int. Cl.[2] G01N *9/26*
U.S. Cl. 73—438 **6 Claims**

1. A portable device adapted for insertion into a body of liquid for measuring the density of said liquid or of a suspension of solids in said liquid comprising:
(a) a hollow holder of predetermined length;
(b) two gas-tight diaphragm type pressure sensors mounted a predetermined distance apart one above the other at one end of the holder and adapted to be submerged in the liquid so that the two sensors are vertically at predetermined levels apart;
(c) a gas-tight differential pressure transducer mounted on the holder at the end opposite from said pressure sensors;
(d) tubes extending through the center of said holder and connecting the two pressure sensors to the differential pressure transducer to form a closed gas circuit therebetween, said differential pressure transducer providing an output voltage proportional to the pressure differential sensed by the pressure sensors;
(e) a medium in said closed gas circuit for coupling the two pressure sensors to the differential pressure transducer, said medium being a gas; and



(f) an enclosure for containing said differential pressure transducer.

4,136,568
ELECTRO-OPTIC SPACE POSITIONER
Herbert R. Seymour, Glen Cove, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.
Filed Jul. 15, 1977, Ser. No. 815,996
Int. Cl.[2] G01M *9/00*; G01H *9/00*
U.S. Cl. 73—655 **2 Claims**



2. In apparatus of the type described for analysis of aircraft wing vibrations under load
a plurality of light emitters located on the aircraft wing,
an electro-optic sensor on the aircraft fuselage including a cylindrical lens for stigmatizing light rays from said emitters at the focal plane of said lens and a photoelectric pick-off device at said focal plane,
said photoelectric pick-off device including a plurality of photodiodes and means for scanning said photodiodes,
digital control means including an emitter driver for sequentially energizing said light emitters, clock means for generating clock pulses controlling said photodiode scanning means, counting means for counting said clock pulses, gate means between said clock means and said counting means, said gate means controlled by the output of said pick-off device,
whereby the clock pulses counted by said counting means indicates the position of said wing at the location of the particular energized emitter.

4,136,569

THERMOSTAT RESETTING DEVICE

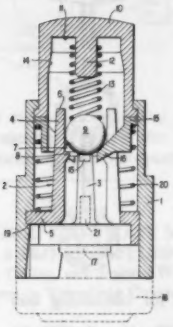
Walter Hollweck, Nüremberg, Fed. Rep. of Germany, assignor to Inter Control, Nüremberg, Fed. Rep. of Germany

Filed Oct. 12, 1976, Ser. No. 731,750

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1975, 2545640

Int. Cl.² G05G *17/00, 1/02*

U.S. Cl. 74—2 **5 Claims**



1. A resetting device coupled to a thermostat which has a resetting pin actuated by depressing the same, comprising:

(a) a housing attached to said thermostat; said resetting pin extending into said housing;

(b) a body arranged to be movable within said housing towards and away from said resetting pin;

(c) a manually operable push button movably supported in said housing and having a position of rest, a fully depressed position and an intermediate, actuating position; said push button including a component arranged to engage said body for moving said body, in unison with the motion of said push button, along a portion of its traveling path while an external pressing force is applied to said push button;

(d) propelling means for launching said body in the direction of said resetting pin for depressing said resetting pin by said body by impact-like engagement between said body and said resetting pin; said propelling means being actuated by said push button upon reaching said actuating position from said position of rest; said propelling means comprising

(1) resilient force exerting means operatively connected to said push button and said body for imparting potential energy to said body at a location spaced from said resetting pin upon actuation of said push button; said resilient force exerting means including a plurality of resilient fingers held in said housing and defining a space between themselves for accommodating said body;

(2) retaining means projecting into the traveling path of said body for obstructing its motion towards said resetting pin at said location; said retaining means having detents carried by said fingers and projecting into said space at a predetermined distance from said resetting pin for engaging said body; said resilient fingers with said detents constituting a resistance to the motion of said body with said push button, said body accumulating said potential energy during obstruction of its motion by said detents; said detents being arranged for releasing said body at a predetermined position thereof during its travel with said push button; said body being propelled from said predetermined positon away from said component of said push button against said resetting pin by the potential energy on said body;

(3) means for releasing said retaining means for propelling said body against said resetting pin by said energy; and

(e) means for maintaining said body out of force-transmitting contact with said push button and said propelling means in said fully depressed position of said push button for providing free mobility of said resetting pin subsequent to said impact-like engagement, irrespective of the position of said push button.

4,136,570

TRANSMISSION GEAR FOR A WIRE GUIDE OF A WINDING MACHINE

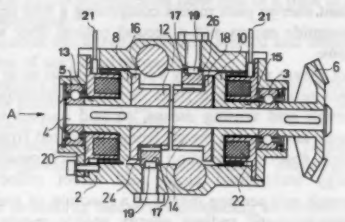
Pavel Zdrahal, Adliswil, Switzerland, assignor to Meteor AG, Rüschlikon, Switzerland

Filed Mar. 28, 1977, Ser. No. 781,872

Claims priority, application Switzerland, Mar. 31, 1976, 3999/76

Int. Cl.² F16H *19/04*

U.S. Cl. 74—34 **5 Claims**



1. Apparatus for converting rotary motion to rectilinear motion, selectively in alternating directions, comprising:

a member disposed to be movable back and forth along the rectilinear path,

rotary drive means including a drive shaft,

first actuatable electro-magnetic clutch means associated with said rotary drive means for moving, when actuated, said member in one direction and second actuatable electro-magnetic clutch means associated with said rotary drive means for moving, when actuated, said member in a direction opposite to said one direction,

each of said clutch means including a rotary coupling member mounted on said drive shaft to be rotatable therewith, a rotary gear member which is rotatable with said rotary coupling member when said respective electro-magnetic clutch means is actuated, said rotary gear member being idly mounted on said drive shaft, each said rotary gear member having a coupling disc carried thereon with each said rotary gear member and each said coupling member of each said clutch means being relatively axially movable on said drive shaft, each clutch means further including a toothed rack having one end connected to said movable member, each said rack being in engagement with one of said rotary gear members so that rotation of a said gear member will effect translation of a said rack engaged therewith,

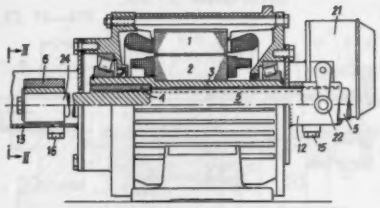
said rotary gear members being located on said drive shaft between said coupling members of said first and second clutch means, said first clutch means including a stationary electro-magnet located externally of its said coupling member on one side of said rotary gear members and said second clutch means including a stationary electro-magnet located externally of its said coupling member on the other side of said rotary gear member of said second clutch means, said apparatus including a housing having an interior surface on which is supported each said stationary electro-magnet.

4,136,571

MANURE DISPOSER INSTALLATION

Herbert Frölichsthal, Hönigthal 54, A 8010 Graz, Austria

Filed Mar. 15, 1977, Ser. No. 778,025
Claims priority, application Austria, Mar. 26, 1976, 2219/76
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—89.15 8 Claims



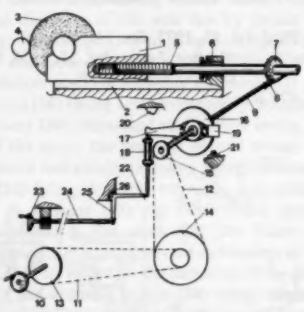
1. In a manure disposal installation: an electric motor having an armature and a hollow sleeve connected coaxially within the armature for rotation therewith, reciprocatory actuating means, a manure shovel, and connection means connecting said shovel to said actuating means, said actuating means including a screwthreaded shaft passing through said sleeve, a nut fixedly mounted in said sleeve to be driven thereby, said nut having threads for engaging said shaft so that rotation of said nut by said motor effects translation of said screw-threaded shaft.

4,136,572

DEVICE FOR INCREMENTAL FEED IN A MACHINE TOOL

Bengt E. Nilsson, Lidköping, Sweden, assignor to Lidköpings Mekaniska Verkstads AB, Lidköping, Sweden

Continuation of Ser. No. 601,824, Aug. 4, 1975, abandoned. This application Jun. 6, 1977, Ser. No. 803,871
Claims priority, application Sweden, Aug. 14, 1974, 7410346
Int. Cl.[2] F16H *29/00*
U.S. Cl. 74—125.5 12 Claims



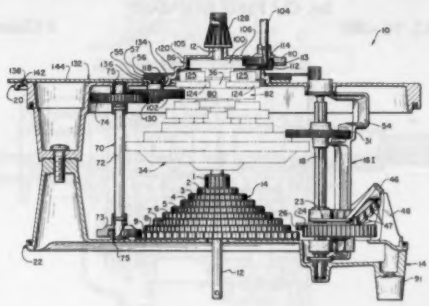
1. In an incremental feed device for a tool or workpiece in a machine tool, wherein the machine tool has a rotatable shaft and feed of said tool or workpiece is effected by rotation of the rotatable shaft; the improvement comprising a circular disk mounted concentrically on said rotatable shaft for rotation therewith, lever means pivotally mounted on the axis of said shaft and adjacent said circular disk, stop means positioned to limit angular displacement of said lever in one direction, linear acting drive means having first and second ends, the first end thereof being coupled to move said lever means into and out of engagement with said stop means, adjustable position mounting means coupled to pivotally support the second end of said linear acting drive means, and selectively operable coupling means mounted to couple said lever means to said circular disk, and rotary drive means connected to said shaft.

4,136,573

EXTENDED RANGE FUEL PUMP COMPUTER PRICE VARIATOR

Bruno S. Smilgys, Hartford; Richard J. Flis, Plantsville, and Raymond H. Devanney, Winsted, all of Conn., assignors to Veeder Industries Inc., Hartford, Conn.

Filed Jun. 27, 1977, Ser. No. 809,991
Int. Cl.[2] F16H *3/22*
U.S. Cl. 74—348 14 Claims



1. In a unit volume price variator for a fuel pump computer settable for establishing the amount of each place of a multiple place unit volume fuel price and having a rotary input adapted to be rotated by a fuel meter in accordance with the volume of fuel delivered; a rotatable primary stack of gears driven by the variator input; a plurality of rotatable drive range arm assemblies for the multiple places respectively having respective rotatable range arm shafts with axes radially offset from and generally parallel to the axis of the primary gear stack, a range arm pivotally and axially shiftable on each range arm shaft for being set into selective engagement with the primary stack of gears for rotating the respective range arm shaft therewith, and a range arm output gear on each range arm shaft; a rotary differential gear mechanism coaxial with the primary gear stack in engagement with the range arm output gears for combining the rotatable drives through the range arms with relative drive ratios in accordance with their respective places; and at least one set of a plurality of price wheels for the multiple places respectively, each connected to the respective range arm assembly for displaying the amount of the respective place of the unit volume price established by the range arm setting; the improvement wherein the variator further comprises an auxiliary higher place price selector mechanism for establishing a next higher place price to said multiple place unit volume price and having an auxiliary rotatable drive take-off assembly with a rotatable take-off shaft generally parallel to and radially offset from the primary gear stack, an input gear mounted on the take-off shaft in operative engagement with one of the gears of the primary gear stack for rotating the take-off shaft therewith, and a first auxiliary higher place drive gear driven by the take-off shaft; and a rotary auxiliary differential mounted coaxially in operative engagement with said differential gear mechanism; the auxiliary higher place price selector mechanism further comprising a shiftable selector lever and a selector gear rotatably mounted on the selector lever for selectively operatively interconnecting said first auxiliary drive gear and auxiliary differential and for being shifted by the selector lever between first and second positions thereof in and out of said operative interconnection respectively; the auxiliary differential being operable for combining the rotatable drives through the differential gear mechanism and selector gear with relative drive ratios in accordance with the respective places of the unit volume price whereby the selector gear is adapted to be selectively shifted to its first position for selectively establishing a first auxiliary higher place price setting.

4,136,574
COUNTERSHAFT GEAR BOXES

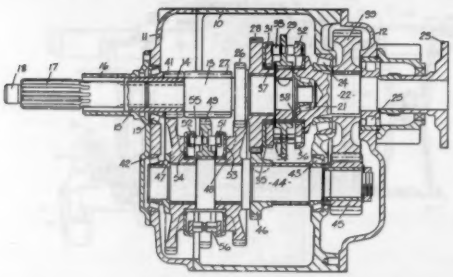
William M. M. Morrison, Shandon 107, Coalway Rd., Wolverhampton, Staffordshire, England

Continuation of Ser. No. 431,408, Jan. 7, 1974, abandoned, which is a continuation of Ser. No. 164,805, Jul. 26, 1971, abandoned. This application Jun. 2, 1976, Ser. No. 692,230

Claims priority, application United Kingdom, Jul. 28, 1970, 36417/70

Int. Cl.[2] F16H *3/08, 37/00*

U.S. Cl. 74—359 **3 Claims**



1. A gear box including a casing having separate input and output ends, an input shaft extending into the casing through the input end, an output shaft extending into the casing through the output end, said input shaft and output shaft being coaxial and relatively rotatable, a lay shaft rotatably mounted in the casing in parallel relationship with the input and the output shafts, an output gear mounted on said output shaft, a complementary output gear permanently in mesh with said output gear mounted on the output shaft and being mounted at one end of said lay shaft, all gears for forward speeds being grouped in meshing pairs, one gear of each pair on said input shaft and lay shaft respectively, each said meshing pair of gears providing a different speed ratio, each speed ratio pair of gears arranged sequentially in accending speed ratio order from said input end towards said output end, synchronizer means for selectively synchronizing all pairs of gears for forward speeds, a synchronizer on the lay shaft for selectively connecting at least the lowest speed ratio pair of gears, at least one further speed ratio pair of gears having one of the pair of gears rotatably carried on the input shaft and the other of the pair of gears being fixed on the lay shaft, a further synchronizer on the input shaft for selectively connecting said further speed ratio gear on the input shaft thereto, whereby all meshing pairs of gears selectively transmit torque from the input shaft through the lay shaft and the complementary output gears to the output shaft.

4,136,575
CHANGE-SPEED MECHANISM

Pierre Labat, Suresnes, France, assignor to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem, Suresnes, France

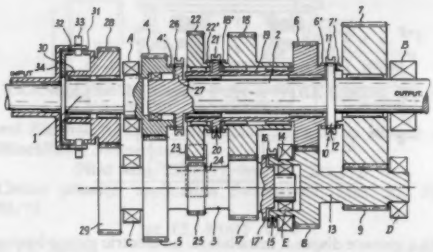
Filed Sep. 21, 1976, Ser. No. 725,175

Claims priority, application France, Sep. 25, 1975, 75 29353

Int. Cl.[2] F16H *3/08*

U.S. Cl. 74—359 **4 Claims**

1. A change-speed transmission mechanism having (n) forward transmission ratios, one reverse transmission ratio, a reverse speed gear set and (n - 1) forward speed gear sets, comprising: an input shaft and an output shaft aligned on a common axis, layshaft means for carrying speed gears and having a layshaft, a common shaft, and a first dog and synchromesh unit for connecting the layshaft and the common shaft parallel to said input and output shafts, the layshaft having rigidly mounted thereon a gear of a speed gear set which is in constant meshing engagement with an input gear rotatably rigid with said input shaft, (n - 2) forward speed gears mounted for free rotation on said output shaft and adapted to be rotatably connected to said output shaft by means of second dog and synchromesh units, and in constant meshing engagement with speed gears carried by said layshaft means, one of said (n - 2) forward speed gears being rigid with a hollow shaft surrounding and extending in the axial direction towards said input shaft, a second of said (n - 2) forward speed gears being



mounted for loose rotation and carried by said hollow shaft, a gear of a train of the reverse speed gear set being mounted for loose rotation on said hollow shaft and carrying dog teeth, and said second of said (n - 2) forward speed gears having dog teeth separated from the dog teeth carried by said gear of the reverse speed gear set by one of said second dog and synchromesh units.

4,136,576
COUNTERSHAFT TYPE POWER TRANSMISSION

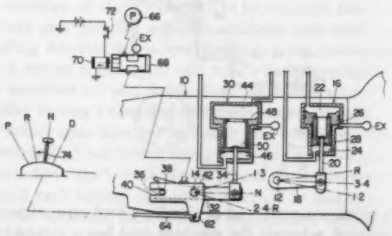
Keizaburo Usui, and Isao Hayama, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 15, 1977, Ser. No. 816,147

Claims priority, application Japan, Jul. 15, 1976, 51-84623

Int. Cl.[2] G05G *9/00*

U.S. Cl. 74—473 R **2 Claims**



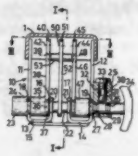
1. A countershaft type power transmission for shifting gears, comprising: a select motor; a select shaft operatively connected with said select motor; a shift motor; a shift shaft operatively connected with said shift motor, said shift shaft and said select shaft cooperating so that rotation thereof selectively engages the gears of the power transmission to shift the transmission between at least one forward speed, neutral and a reverse speed; a control lever having at least one forward drive position, and neutral position and a reverse position; and means for disconnecting the operative connection between said shift motor and said shift shaft in response to movement of said control lever toward and into the reverse position.

4,136,577

DEVICE FOR CONNECTING EITHER ONE OF TWO ALTERNATIVE OPERATING MEMBERS WITH AN OPERATED MEMBER

Kjell I. Borgersen, Hjälteby, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

Filed Nov. 10, 1976, Ser. No. 740,652
Int. Cl.[2] G05G *11/00*
U.S. Cl. 74—479 4 Claims



1. A device for connecting either one of two alternative operating means (5,6), each of which comprises an elongated operating member (7,8) having axial operating movement, to a means intended for operation which also has an elongated, axially movable operated member (9), the operating members (7,8) of the two operating means being each connected to an individual first (38) and second (46) swing arm, said swing arms being rotatable about a common axis line (22) extending in a transverse direction to the direction of movement of the operating members; the operated member (9) being connected to a third swing arm (52) which is rotatable about said axis line (22) and situated between the first and second swing arms (38,46); each of the first and second swing arms (38,46) having coupling means (39,48) arranged to connect the first and second swing arms (38,46) to cooperating coupling means (53) of the third swing arm (52) in a non-rotatable manner during coupling movement parallel with said axis line (22); the first and second swing arms (38,46) being immovable in the direction of the axis line (22) while the third swing arm (52) is movable back and forth in the direction of the axis line by means of manually operable moving means (34) so as to be coupled to either one of the first and second swing arms (38,46) in a predetermined relative rotation position between the third (52) and the first (38) or second (46) swing arm, respectively, manually operable rotating means (34) connected to the third swing arm (52) for rotation of the same, the first and second swing arms (38,46) being rotatably and axially movably journalled on a shaft (22); the shaft (22) being, in turn, rotatably and axially movably journalled in a frame (10); the third swing arm (52) being rigidly connected to the shaft (22); the frame (10) having guides (11, 16,17,12) which prevent movement of the first and second swing arms (38,46) in the direction of the shaft (22); and the moving and rotating means (34) being connected to the shaft (22) for axial movement and rotation of the same.

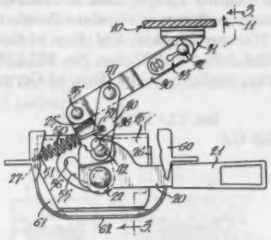
4,136,578

CLOSURE OPERATOR

Marlo G. Van Klompenburg, Owatonna, Minn., assignor to Truth Incorporated, Owatonna, Minn.

Filed Feb. 17, 1977, Ser. No. 769,578
Int. Cl.[2] G05G *1/04*
U.S. Cl. 74—520 11 Claims

1. A closure operator having a base, an opener link connectable to a closure, an operating handle movable on said base between two positions, an idler link movably mounted on said base and pivotally connected to said opener link adjacent an end thereof to control movement of the opener link relative to the base, and a driver link extending between said handle and opener link and being pivotally connected to each of said handle and opener link to impart handle movement to the



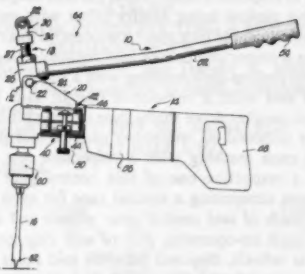
opener link with the idler link guiding the movement of the opener link.

4,136,579

FORCE LEVER ATTACHMENT FOR HAND TOOLS

Merle W. Robinson, 109 College Dr., and Lynn M. Robinson, 512 N. Streeter, both of Hesston, Kans. 67062

Filed Jan. 24, 1977, Ser. No. 761,641
Int. Cl.[2] G05G *1/04;* B23B *47/00, 39/00*
U.S. Cl. 74—523 10 Claims



1. An attachment for an instrument having a tool secured thereto, said tool having an outermost tip, said attachment comprising:

a toggle joint including a pair of rigid links pivotally interconnected for relative swinging movement, presenting a knee,

one of said links being adapted for connection with said instrument and the other of said links having a pressure-exerting end; and

means for rigidly connecting said one link to said instrument to effectively form a rigid extension of said one link, whereby said tip of the tool will define one point of the toggle joint, said knee will define a second, middle point of the toggle joint, and said end of the other link will define a third point of said toggle joint,

said links being normally disposed out of alignment such that when they are swung relatively at the knee between a pair of spaced abutments and in a direction tending to align said three points, said tip of the tool will exert pressure on one of the abutments and said end of the other link will exert pressure on the other of said abutments.

4,136,580

POWER BRANCHING TRANSMISSION

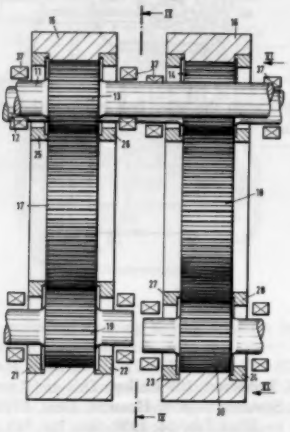
Wilhelm Brand, Hanover; Manfred Dienst, Burgdorf; Adolf Herbert, and Gunther Henjes, both of Hanover, all of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover Kleefeld, Fed. Rep. of Germany

Filed Jun. 16, 1977, Ser. No. 807,125

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1976, 2628387

Int. Cl.[2] F16K *37/06*

U.S. Cl. 74—665 GA 4 Claims



1. In power branching transmission, having two parallel output shafts, two output drive pinions rotationally rigidly connected to respective ones of said parallel output shafts, said output drive pinions being axially offset with respect to one another, two rotatable ring gears, two central gear wheels each disposed in a respective one of said rotatable ring gears, said output drive pinions each meshing with a respective one of said ring gears and with a respective one of said central gear wheels, two parallel drive shafts, two driving pinions rotationally rigidly disposed on respective ones of said parallel drive shafts and each meshing with a respective one of said ring gears and a respective one of said central gear wheels, the improvement comprising a coaxial race for each of said ring gears and each of said central gear wheels and a supporting roller for each co-operating pair of said ring gears and said central gear wheels, disposed between said races and bracing respective ones of said ring gears and co-operating central wheels with respect to one another.

4,136,581

CONTINUOUSLY ADJUSTABLE TRANSMISSION WITH TWO SPEED RANGES

August Winter, Friedrichshafen, and Anton Ott, Tettnang, both of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

Filed May 4, 1977, Ser. No. 793,889

Claims priority, application Fed. Rep. of Germany, May 15, 1976, 2621682

Int. Cl.[2] F16H *37/08*

U.S. Cl. 74—689 7 Claims

1. A continuously adjustable transmission inserted between a source of motive power and a load, comprising:

a drive shaft connectable to said source;

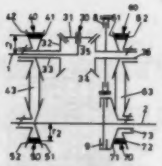
a driven shaft connectable to said load;

differential gear means having a summing input connected with said drive shaft and two differential outputs connected with a pair of satellite shafts;

a first steplessly variable coupling connecting one of said satellite shafts with said driven shaft;

a second steplessly variable coupling connecting the other of said satellite shafts with an intermediate shaft;

brake means engageable with said other of said satellite shafts for immobilizing same together with said intermediate shaft; and



coupling means enabling entrainment of said driven shaft by both satellite shafts at a lower speed in a disengaged state of said brake means and by said one of said satellite shafts at a higher speed in an engaged state of said brake means.

4,136,582

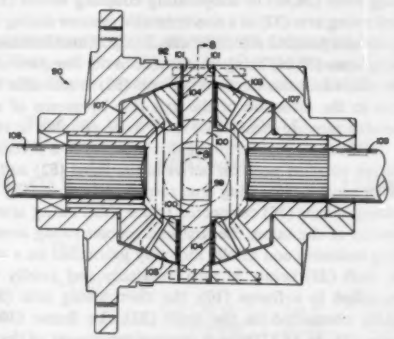
SHAFT AND BORE COMBINATION

Francis H. Boor, Lafayette, Ind., assignor to Fairfield Manufacturing Co., Inc., Lafayette, Ind.

Filed Apr. 21, 1976, Ser. No. 678,972

Int. Cl.[2] F16H *1/42*

U.S. Cl. 74—710 8 Claims



1. In the combination of a shaft having an external surface and a member having a bore surrounding said shaft which bore has an internal surface and with one of said shaft and member being fixed and the other of said shaft and member being rotatable, the improvement including one of said internal and external surfaces comprising a first cooperating surface portion having a constant radius and extending through an angle of 360 degrees and generated about an axis, the other of said internal and external surfaces comprising two opposed second cooperating surface portions each having a radius matching said constant radius and each extending through an angle of less than 180 degrees, the centers of the radii for said two opposed second cooperating surface portions being offset from each other and from said axis, said other of said internal and external surfaces having another portion with a dimension different than that of said radii as measured from the respective centers of said radii, and said two opposed second cooperating surface portions tapering toward said axis as they extend from one end

portion of said other of said internal and external surfaces to the other end portion.

4,136,583

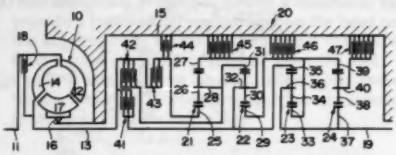
Patent Not Issued For This Number

4,136,584

AUTOMATIC TRANSMISSION FOR AUTOMOBILES

Kazuo Ishikawa, Ichinomiya, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 6, 1977, Ser. No. 794,631
Claims priority, application Japan, May 11, 1976, 51-54021
Int. Cl.² B60K *41/06*
U.S. Cl. 74—867 **8 Claims**



1. Automatic transmission for automobiles which comprises gear means having at least one frictional constraining means adapted for selective operation to provide a plurality of different speed ratios, actuator means associated with said constraining means, control circuit means including at least one hydraulic pressure line for the actuator means to provide a supply of operating pressure to said actuator means, said control circuit means further including at least one return line, trimmer valve means disposed between said hydraulic pressure line and said return line and including at least one valve member biased toward a first position wherein the hydraulic pressure line is blocked from communication with the return line, means for applying hydraulic pressure in the pressure line to the valve member so that the valve member is urged under the pressure toward a second position wherein the hydraulic pressure line is opened to the return line whereby the pressure in the hydraulic pressure line is allowed to leak into the return line to produce a modified pressure in the hydraulic pressure line, means for applying the modified pressure to the valve member so that the valve member is urged by the modified pressure toward the first position, and means for establishing in the return line a pressure corresponding to engine load.

4,136,585

SHARPENING MACHINE FOR SAWS

Peter Lenard, Biberach an der Riss, Fed. Rep. of Germany, assignor to Vollmer Werke Maschinenfabrick GmbH, Biberach, Fed. Rep. of Germany

Filed Mar. 29, 1977, Ser. No. 782,450
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614419
Int. Cl.² B23D *63/14*
U.S. Cl. 76—40 **3 Claims**

1. A sharpening machine for sharpening toothed saws comprising:

a support for a saw blade supporting said blade for adjustment in a direction of feed;

a carrier mounted for rotation about a tilting axis oriented perpendicular relative to the plane of said saw blade;

a lifting carriage shiftably guided on said carrier for reciprocal movement toward and away from the blade along a swiveling axis lying in the plane of said saw blade and intersecting said tilting axis;

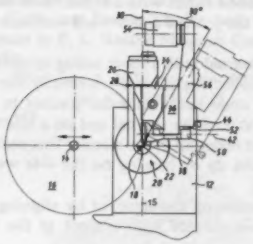
a spindle head mounted on said lifting carriage;

a spindle journalled on said spindle head, the axis of said spindle intersecting said swiveling axis; and

a grinding wheel mounted to said spindle;

said carrier being rotatable in a range of at least 90° about said tilting axis, said tilting range lying on both sides of a neutral position in which the spindle axis is disposed in a plane parallel to said direction of feed;

said spindle head being mounted to said carrier by means of said lifting carriage and is swivable relative to said carrier about said swiveling axis;



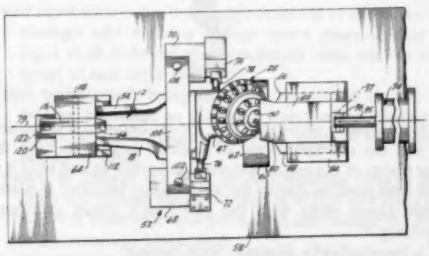
said spindle head further having first and second standard positions each of which standard positions defined by said spindle axis being located in or parallel to the plane of said saw blade, the swiveling range of said spindle head being at least 30° to either side of each of said first and said second standard positions; said spindle head being arranged to be rotated about said swivel axis by 180° from said first standard position to said second standard position and vice versa when said carrier is in said neutral position.

4,136,586

METHOD FOR CONSTRUCTING A MULTIPLE SEGMENT ROCK BIT

William J. Neilson, Whittier, and Dwight A. Rife, Mission Viejo, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Oct. 17, 1977, Ser. No. 842,614
Int. Cl.² B21K *5/02*
U.S. Cl. 76—108 A **17 Claims**



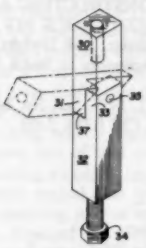
1. A method of accommodating tolerances developed in the fabrication of a rock bit segment of a multiple segment rock bit, each segment having a pin end, a leg, a journal extending from the leg and a cone cutter mounted on the journal for rotation about a rotational axis of the journal, the cone cutter having a gage diameter corresponding to the diameter of the rock bit and a gate point on the gage diameter where the cone cutter is to engage the side wall of a hole being drilled by the rock bit, the method comprising the steps of:

(a) supporting the cone cutter at the gage point to establish a fixed position of the gage point with respect to a datum;

(b) supporting the pin end of the segment to establish a fixed position of the pin end with respect to the datum;

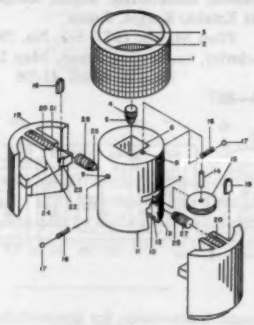
(c) loading the cone cutter with an axial force acting parallel to the axis of the journal and toward the leg;
(d) loading the segment with a force acting parallel to the axis of the journal opposite the force on the cone cutter to establish equilibrium between such forces, whereby the tolerances between the cone cutter and the journal in a direction axially of the journal are taken up in the manner that such tolerances would be taken up by bearing on the bottom wall of a hole being drilled;
(e) loading the cone cutter with a radial force acting normal to the axis of the journal and toward such axis at the gage point;
(f) loading the journal with a force acting opposite the radial force to establish equilibrium, whereby the tolerances between the cone cutter and the journal in a direction radial of the axis of the journal and on a line through the gage point are taken up in the manner that such tolerances would be taken up by bearing on the side wall of a hole being drilled;
(g) angularly orienting the segment by aligning preformed faying surfaces thereof with respect to the datum; and then
(h) holding the segment fixed with respect to the datum with the loads applied; and then
(i) finishing the faying surfaces to develop the required position of the included angle; and then
(j) assembling the rock bit by welding the segments together along their faying surfaces.

4,136,587
BREAK-JOINT POWER PISTON SCREW JACK
Julian A. Howard, Main St., New Haven, Ky. 40051
Filed Nov. 16, 1977, Ser. No. 851,860
Int. Cl.[2] B66F *11/00*
U.S. Cl. 81—3 R **3 Claims**



1. A lengthwise adjustable jack for use between a stationary base and the overspeed link of a diesel engine to raise the power piston of the engine's control governor to and hold it in its full load position during the adjustments required to match the fuel pump racks with the governor's piston gage gap, comprising:
A. a longitudinally elongate body having
1. opposite sides, including a strike side,
2. an upper part having an upper end engagable with said link,
3. a lower part having a lower end engagable with said base,
4. a transverse pivot
a. hinging the parts pivotally for angular movement back and forth between
i. a locked joint position, wherein their longitudinal planes, which extend through the longitudinal center axis of the pivot, point in one direction and cooperate to form, on the strike side of said body, a fixed angle slightly greater than 180°; and
ii. a broken joint position, wherein said planes point in the opposite direction and cooperate to form, on the strike side of said body, another angle less than 180°,
B. means on said body for adjusting the length of said body.

4,136,588
ALIGNED SLIDING JAW KEY SET
Peter G. Roder, 243 No. 16th St., San Jose, Calif. 95112
Filed Mar. 25, 1977, Ser. No. 781,499
Int. Cl.[2] B25B *13/12*
U.S. Cl. 81—165 **8 Claims**

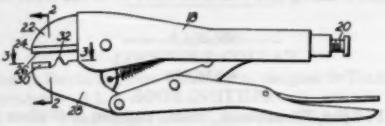


1. A chuck-type tool for grasping nuts and bolts for the purpose of imposing torque thereon; comprising:
(a) a cylindrical center piece having a longitudinal axis and having therein drive means adapted to receive a drive handle;
(b) a slide groove formed in said cylindrical center piece and extending diametrically thereacross;
(c) at least two jaw members mounted on said cylindrical center piece for radially directed movement in relation thereto, each said jaw member including a slide member slidably engaging said slide groove and a jaw section presenting two angularly disposed gripping surfaces thereon facing corresponding gripping surfaces on the other jaw member;
(d) means rotatably journaled on said cylindrical center piece operatively associated with said jaw members and selectively manipulable to effect movement of said jaw members toward or away from each other to decrease or increase the space between said gripping surfaces; and
(e) each said jaw member including an axially extending semi-cylindrical body portion having an inner peripheral surface divided longitudinally by a transversely extending semi-circular integral support wall to define an upper support portion including said slide member and a lower jaw section, said slide member being integral with said inner peripheral surface of the semi-cylindrical body portion and the side of said support wall remote from said jaw section.

4,136,589
KEY HOLDING TOOL
John Kerr, 1505 SE. Division, Portland, Oreg. 97202
Filed Jul. 11, 1977, Ser. No. 814,479
Int. Cl.[2] B25B *7/02*
U.S. Cl. 81—425 A **1 Claim**

1. A key holding tool for keys of the type having a shank portion and a flat head portion with a key ring hole therein, said tool comprising
(a) first and second jaws having forward ends and arranged for movement between open and closed positions,
(b) a flat longitudinal base surface on said first jaw leading rearwardly from said forward end and facing said second jaw,

(c) said base surface being arranged to engage flatwise one side of the head portion of a key,
(d) a longitudinally extending sharpened projection on said second jaw leading rearwardly from said forward end and being directed toward said base surface,
(e) said projection being arranged to cut slightly into the metal of the head portion of a key when the jaws are clamped on a key,



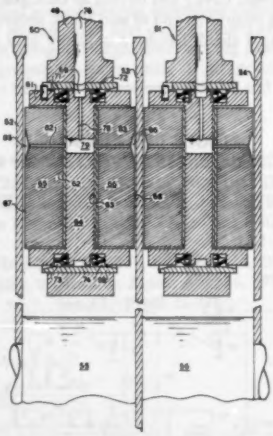
(f) said sharpened projection having a dimension such as to provide a longitudinal engagement on the head portion of the key to clamp it firmly against said base surface and form a rigid extension of the key from the tool,
(g) and an integral post on said second jaw spaced rearwardly from said sharpened projection and arranged to fit in the key ring hole in the key.

4,136,590

FLOATING PAD SAW GUIDE

William W. Kordyban, Prince George, Canada, and Lutz Claassen, deceased, late of Delta, Canada (by Gayle L. Claasen, administratrix), assignors to Hawker Siddeley Canada Ltd., Toronto, Canada

Filed Aug. 9, 1977, Ser. No. 823,085
Claims priority, application United Kingdom, Aug. 12, 1976, 33544/76
Int. Cl.² B27B *11/02, 5/38*
U.S. Cl. 83—169 **6 Claims**



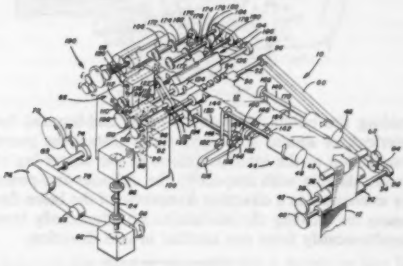
1. A saw guide for use between circular saw blades fixed on an arbor comprising:
(a) guide holder means having a cylindrical annular head extending between the saw blades,
(b) a cylindrical guide member having flat parallel opposed faces confronting the saw blades and having a loose axially movable and tiltable fit in the annular head,
(c) a pair of annular lip seals mounted on the guide member in spaced relationship having a deformable resilient sealing fit against the annular head,
(d) first fluid passage means extending through the guide holder means for delivering fluid under pressure between the lip seals,
(e) second restricted fluid passage means extending through the guide member having an intake port between the annular lip seals and discharge ports opening out of the faces of the guide member for enabling variation of sealing frictional pressure of the lip seals against the annular head corresponding to variation in pressure of fluid delivered through said first fluid passage means.

4,136,591

APPARATUS FOR CHANGING THE LENGTH OF ENVELOPE BLANKS CUT FROM A CONTINUOUS WEB

Herbert W. Helm, and Dennis Ziegler, both of Hollidaysburg, Pa., assignors to F. L. Smithe Machine Company, Inc., Duncansville, Pa.

Filed Jun. 6, 1977, Ser. No. 803,678
Int. Cl.² B31B *1/16*
U.S. Cl. 83—355 **9 Claims**



1. In an envelope machine, apparatus for changing the length of envelope blanks cut from a continuous roll of web material comprising,
a drive shaft of the envelope machine,
said drive shaft arranged to rotate at a preselected speed,
web feeding apparatus for conveying web material at a preselected speed relative to the speed of said drive shaft,
web cutting apparatus for cutting the web material at preselected intervals to form envelope blanks therefrom,
a variable speed drive mechanism having an input shaft and an output shaft,
a plurality of meshing change speed gears connecting said drive shaft to said input shaft,
said input shaft being drivingly connected to said drive shaft through said meshing change speed gears so that said input shaft is driven at a preselected ratio relative to the speed of said drive shaft,
said output shaft being drivingly connected to said web feeding apparatus so that said web feeding apparatus is driven at a predetermined ratio relative to the speed of said drive shaft,
means to change the ratio of said meshing change speed gears and change the speed ratio at which said input shaft is driven relative to said drive shaft and change the length of the envelope blank, and
said variable speed mechanism being operable to change the speed of said output shaft relative to the speed of said input shaft to further change the length of the envelope blank and change the length of the throat section of the envelope.

4,136,592

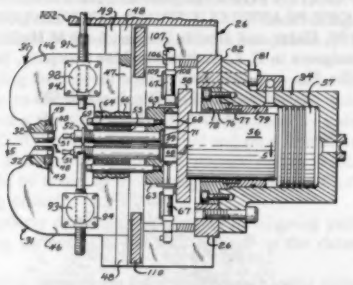
APPARATUS FOR ONE-PASS PUNCHING OF BEAMS

William C. Beatty, Munster, Ind., assignor to Beatty Machine & Manufacturing Co., Hammond, Ind.

Filed Jun. 1, 1976, Ser. No. 691,343
Int. Cl.² B26F *1/14;* B26D *5/04*
U.S. Cl. 83—516 **4 Claims**

1. A press for punching a flange of a beam extending therethrough, including a pair of punch assemblies aligned trans-

versely of a beam flange; each assembly including a die portion and a movable punch, and a sturdy C-frame adapted for the passage of a beam flange therethrough, and carrying the die in one end-leg thereof; cylinder-and-piston means for actuating the punches; each C-frame being of self-sufficient strength for withstanding the thrust of the punch in punching a hole through the flange of a structural steel beam; and each C-frame



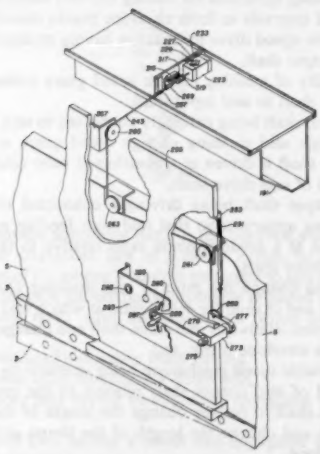
guiding the punch through its other end-leg and having an interlock of similar sturdiness for withstanding punch thrust transmitted to the interlock through the center-leg of the C-frame, slidable with respect to the cylinder-and-piston means for movement in a direction transverse of the beam flange; and means for moving the assemblies simultaneously toward and simultaneously from one another in said direction.

4,136,593

FRONT OPERATED RAKE ADJUSTMENT ASSEMBLY

Wilbur G. Short, Browns, Ill., assignor to Canron, Inc., Oakland, Calif.

Filed Mar. 11, 1977, Ser. No. 776,634
Int. Cl.[2] B23D *15/08*; B26D *5/12*
U.S. Cl. 83—624 **3 Claims**



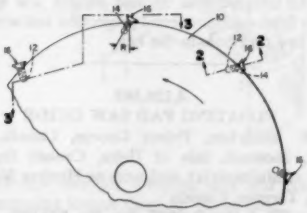
1. A shear machine or the like comprising side walls, an upper knife supported on the lower portion of a movable ram, reciprocal drive means including a pair of hydraulic, series-connected drive pistons, pivotally connected at each end of said movable ram, means altering the position of one end of said ram with respect to the other including means controlling quantity of fluid in said hydraulic series connection between said piston pair, said controlling means including means mechanically actuating a biased valve in said series connection by controlling the effective length of a cable attached to said biased valve, and adjustment means for controlling said effective cable length supported on a stationary plate disposed in front of said ram and coupled with said cable behind said stationary plate, said adjustment means including a pivot axis mounting assembly on said stationary plate having a rotatable shaft therethrough from one side of said stationary plate to the other, a tensioning arm behind said stationary plate, one end of said arm fixed to said rotatable shaft and the other including a pulley in interrupting relationship with the path of said cable, and means rotating said rotatable shaft from the front of said plate.

4,136,594

CUTTING TOOL

Robert P. Tyler, Westminster, Mass., assignor to Wallace Murray Corporation, Fitchburg, Mass.

Filed Apr. 14, 1977, Ser. No. 787,317
Int. Cl.[2] B27B *33/08, 33/14*
U.S. Cl. 83—839 **15 Claims**



1. A cutting tool comprising a metallic support member for supporting and moving a cutting element in a cutting path, said support member having at least one tapped cavity, and

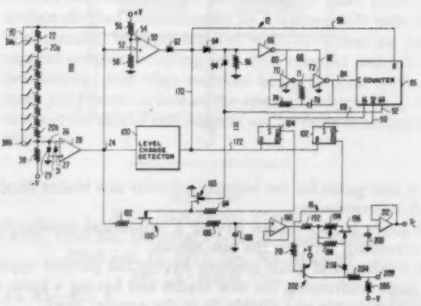
a cutting element having an elongated threaded shank engaged in said cavity and having an enlarged head carrying a cutting edge at an end of said shank projecting from said cavity, said shank having a negative rake angle of 5° to 40°.

4,136,595

SINGLE BUS KEYBOARD

Timothy C. Gillette, Brookline, Mass., assignor to ARP Instruments, Inc., Lexington, Mass.

Filed Oct. 19, 1976, Ser. No. 733,772
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 **7 Claims**



1. A control circuit for electronic musical instruments, comprising

A. means responsive to the playing of one or more notes on a musical instrument to generate signal levels indicative of each note, as well as at least one non-zero signal level indicative of the playing of no notes,

B. level change detection means responsive to said level

generating means and providing an output in response to changes in said levels,

C. gating means responsive to said level generating means to provide a gating signal indicative of the playing of no note, and

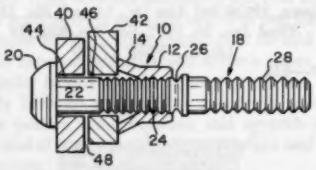
D. means responsive to both said level change detection means and said gating means for generating a control signal only when at least one note is played and maintaining said control signal when all keys are released.

4,136,596

LOCKBOLT COLLAR

Samuel B. Davis, Jr., New Galilee, Pa., assignor to Textron Inc., Providence, R.I.

Filed Aug. 17, 1977, Ser. No. 825,262
Int. Cl.² F16B *19/05*
U.S. Cl. 85—7 **3 Claims**



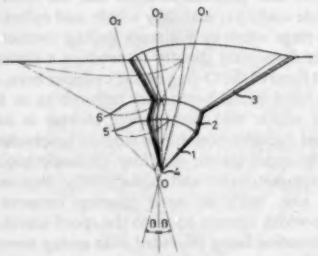
1. In combination, a plurality of rigid members having aligned openings, a lockbolt, and a collar, the lockbolt having a preformed head adjacent one of said rigid members, a shank portion connected to the head and extending through the openings and locking grooves formed on the shank and extending beyond the rigid members, said collar positioned on the shank and with an interior defined by a cylindrical first section, and a flared skirt second section extending angularly outward from the first section, said first section and a portion of said second section being in swaged interlocking relationship with said locking grooves so as to form a tight connection of the rigid members between the preformed head and the skirt section.

4,136,597

DRILL SCREW AND DIE FOR PRODUCING SAME

Akira Takemura, and Tadao Utsumi, both of Kyoto, Japan, assignors to Kabushiki Kaisha Yamashina Seikosho, Koyto, Japan

Filed Aug. 22, 1977, Ser. No. 826,555
Claims priority, application Japan, Aug. 24, 1976, 51/100178
Int. Cl.² F16B *25/00*
U.S. Cl. 85—41 **1 Claim**



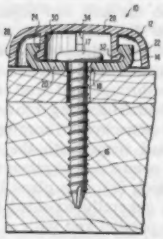
1. A drill screw comprising a head having a rotating tool engaging means, a threaded portion and a drill point portion, such drill screw being characterized in that said drill point portion consists of substantially identical two half drill point portions each of which includes a half conical portion, a half cylindrical portion and a half truncated conical portion produced be equal division and arranged successively from the forward end of each drill point portion, said two half drill point portions being juxtaposed against each other in such a manner that their center axes are inclined in opposite directions through the same angle with respect to the center axis of the drill screw, and the center axes of the two half drill point portions intersecting each other slightly outwardly of the forward ends of the half drill point portions.

4,136,598

SNAP-ON CAP AND WASHER ASSEMBLY

Rodney R. Hughes, Hebard Hill Rd., Randolph, Vt. 05060

Filed Aug. 19, 1977, Ser. No. 826,096
Int. Cl.² A47G *3/00*; F16B *15/02*
U.S. Cl. 85—53 **2 Claims**



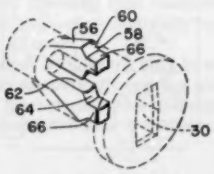
1. A snap-on and washer assembly for a screw or like fastener which comprises a cap piece having a circumferential skirt and a centrally located cylindrical hub equipped with an outwardly extending annular flange said hub being divided into sections by radial cuts, and a washer having a circumferentially located cylindrical wall equipped with an inwardly extending annular flange adapted to draw the hub inside the wall after the outwardly extending flange of said cap piece passes the innermost extent of said inwardly directed flange and to fixedly receive the cylindrical hub of said cap piece in a snap-fit connection.

4,136,599

PLASTIC SCREW GROMMET

Victor S. Hammer, Jr., Hoffman Estates, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Dec. 1, 1977, Ser. No. 856,474
Int. Cl.² F16B *13/04*
U.S. Cl. 85—80 **5 Claims**



1. A one-piece plastic screw grommet for use in mounting a screw relative to a blind bore of a predetermined diameter located in a fibrous material panel, said grommet including a head and a shank having a common bore passing through said head into said shank, said shank having an upper first portion with an external dimension adjacent said head substantially equal to said predetermined bore diameter and said shank carrying axially disposed rotation prevention means thereon, circumferentially disposed shoulder means intermediate the extremities of said shank and projecting radially beyond said predetermined dimension, an intermediate tapered portion connecting said predetermined dimensioned upper portion and

a lesser dimension lower portion extending to the free end of said shank opposite said head, said shoulder means being at least two in number and disposed on said upper portion with said tapered intermediate portion blending into the lowest axially located shoulder means, said shank further including at least two axially extending slots which communicate between the common bore and the external surface of said shank, a shouldered arm positioned in each of said slots and connected at one extremity adjacent the said lesser dimension lower portion and extending toward said head, each said shouldered arm on its radially outer surface being tapered outwardly to an intermediate point and thence inwardly to form shoulder means, the inner surface of said arms adjacent their point of connection to said shank lower portion initially having substantially parallel opposed surfaces extending axially to an intermediate point and then diverging outwardly away from one another to form a throat, adapted to lead in a screw, said intermediate point on the inner surface of said arms lying in a plane transverse to the axis and adjacent to or on a plane passing through the shoulder means carried by said arms, and axially extending flange means integral with and extending from the double tapered free ends of said arms, said common bore is non-circular through said head and a substantial portion of said shank and thence blending into a cylindrical bore in said lower portion said non-circular bore being generally in cross section an elongated shape with the major sides diverging linearly from their connection to substantially flat ends toward their midpoints which fall on a plane lying in the axis of the fastener to form a generally six-sided figure, each third side being substantially parallel and with at least two pairs of said parallel sides being spaced a distance substantially equal to the pitch diameter of a screw to be used therewith whereby said screw will be guided into axial alignment with said cylindrical bore in said lower portion thereby substantially preventing canted introduction of said screw.

4,136,600

ARRANGEMENT FOR CONTROLLING THE SPEED OF A HYDRAULIC MOTOR

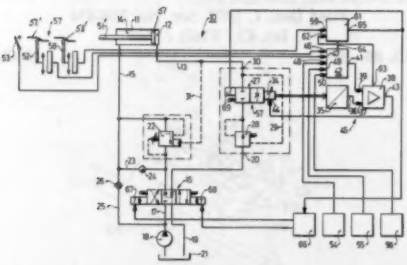
Joachim Heiser, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 4, 1977, Ser. No. 775,363

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1976, 2609434

Int. Cl.[2] F15B *9/03, 9/09, 15/22*

U.S. Cl. 91—27 **6 Claims**



1. In combination with a hydraulic motor having a movable member with a pair of opposite faces to be alternatingly impinged by pressure fluid to move the movable member in one and the opposite direction, a control arrangement for controlling the hydraulic motor comprising a source of pressure fluid; a pair of conduit means for feeding pressure fluid from said source onto said opposite faces, or to discharge pressure fluid therefrom; first valve means interconnected with said conduit means for controlling the direction of movement of said movable member; second valve means interconnected with said conduit means for controlling the speed of the movable member in dependence on the position thereof and comprising a throttle valve in one of said conduit means and having a valve slide movable between a plurality of positions respectively controlling the amount of pressure fluid passing therethrough, a pressure reducing valve upstream of said throttle valve in said one conduit, and a proportional magnet connected to said valve slide for moving the same between the positions thereof; a first inductively operated position transducer connected with said proportional magnet into a feed-back position control circuit; a first electrical control device coordinated with said feedback position control circuit; control means actuated by said movable member for influencing the change of the speed of the latter in dependence on the position thereof, said control means including at least a second inductively operating position transducer for indicating the actual value of displacement of said movable member, said control means forming part of a second feedback circuit.

4,136,601

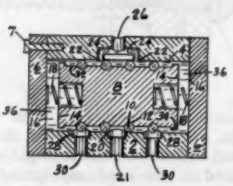
NO TIE DOWN VALVE

Nicholas Sama, 19120 Bel Aire Dr., Miami, Fla. 33157

Filed Jun. 20, 1977, Ser. No. 808,376

Int. Cl.[2] F16K *17/04*

U.S. Cl. 91—424 **5 Claims**



1. A fluid power device, hereinafter referred to as a no tie down valve, having two input ports, an output port, and an exhaust port, and so constructed that

a pressurized output results if and only if both inputs are pressurized within an interval of time determined by design parameters of the device, and

the output becomes depressurized if initially pressurized and either or both inputs is then depressurized;

said device comprising a cylinder and a coacting spool, in combination,

said cylinder consisting of a portion having a cylindrical bore capped sealingly and preferably square to the cylindrical bore axis at both ends by end-caps, with fluid-flow porting on said cylinder bore as hereinafter described;

said spool comprising a cylindrical piston having end-faces preferably square to the piston axis, and four ring-type seals such as O-rings seated in circumferential grooves appropriately formed on said piston, with said piston, said seals, and said grooves so sized that the resulting spool may slide easily yet sealingly within said cylindrical bore; said O-rings when in minimum sealing contact with said cylinder deforming slightly to produce a circumferential contact band of the O-ring on the cylinder bore, and width of this band being hereinafter referred to as the O-ring contact width; said piston being shorter in axial extent than said cylinder bore by an amount hereinafter referred to as the spool travel; said four circumferential grooves being symmetrically and equispatially disposed on said piston axis, with an axial spacing between adjacent groove-width centers equal to the spool travel;

said combination being provided with spring means to maintain said spool in a symmetrical position with respect to said cylinder bore whenever neither of said inputs is pressurized, with said symmetrical position being hereinafter referred to as the center position of said spool, while the two extreme positions of travel of said spool will hereinafter be referred to as the left position and the right position, respectively;

said left, center, and right positions, together with said four O-rings, defining and locating nine distinct hypothetical circumferential zones on the bore of said cylinder; said zones being defined by the said O-ring contact bands on said bore as located by the three distinct configurations of said spool in the left, center, and right positions, respectively; said zones being hereinafter referred to by consecutive ordinal number, with the leftmost zone being the first zone, the next to leftmost zone being the second zone, and so on,

said cylinder having a left input port on said bore lying entirely between said first and third zones, with at least a portion lying between said first and second zones, and at least a portion lying between said second and third zones;

said cylinder having a left output port on said bore lying entirely between said third and fourth zones;

said cylinder having an exhaust port on said bore lying entirely between said fourth and sixth zones, with at least a portion lying between said fourth and fifth zones, and at least a portion lying between said fifth and sixth zones;

said cylinder having a right output port on said bore lying entirely between said sixth and seventh zones;

said cylinder having a right input port on said bore lying entirely between said seventh and ninth zones, with at least a portion lying between said seventh and eighth zones, and at least a portion lying between said eighth and ninth zones;

said output ports being connected by a fluid-flow connecting means to a common output duct; said output duct having its outer terminus on the outer surface of said cylinder, with said outer terminus adaptable for fluid-flow connection to extenal fluid power systems;

said input ports being the inner termini of respective input ducts; said input ducts having their respective outer termini on the outer surface of said cylinder, with said outer termini adaptable for fluid-flow connection to external fluid power systems;

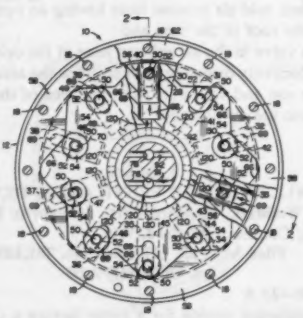
said exhaust port being the inner terminus of an exhaust duct having its outer terminus on the outer surface of said cylinder, with said outer terminus optionally adaptable for fluid-flow connection to external fluid power systems.

4,136,602

HYDRAULIC MOTOR

Leonard L. Lenz, 7400 Miami Lakes Dr., Miami Lakes, Fla. 33166

Filed May 24, 1976, Ser. No. 689,668
Int. Cl.[2] F01B *13/06*
U.S. Cl. 91—491 **21 Claims**



1. A hydraulic motor of the type designed to deliver high torque at relatively low speed, said hydraulic motor comprising:

a casing,

a shaft having fluid inlet and outlet passages mounted within said casing in movable relation to said casing,

a cylinder housing fixed to said shaft and disposed in substantially surrounding relation to said shaft,

said cylinder housing including a plurality of cylinders formed therein in spaced relation to one another and in radially, outwardly extending relation to the central axis of said shaft,

valve means mounted on said shaft in floating relation to said shaft and said cylinder housing,

said valve means being connected to said casing and disposed in fluid regulating disposition between said fluid inlet and outlet passages in said shaft and said plurality of cylinders;

a piston movably disposed in each of said plurality of cylinders;

each piston being dimensioned and configured relative to the corresponding cylinder so as to be movable in floating relation to the interior of the respective cylinder;

cam means mounted in said casing and disposed in substantially outwardly surrounding relation to said cylinder housing,

said cam means comprising a cam element having a continuous cam surface defined by a plurality of surface portions disposed in angular orientation to one another, said adjacently positioned of said angularly oriented surface portions being disposed in oppositely inclined relation to one another thereby defining alternately disposed high and low points on said cam surface, the relative orientation of said cam surface portions being configured to determine the operable speed of said hydraulic motor whereby different operating characteristics of said motor may be accomplished by substituting cam means therein which include surface portions of different angular configurations,

cam follower means connected to each of said pistons and disposed in movable driving engagement with said cam surface portions,

whereby fluid passing through said valve means into said predetermined plurality of cylinders causes outward movement of said pistons relative to said shaft,

said cam follower means moving into driving engagement with said cam means to cause rotation of one of said casing and shaft;

each of said pistons being disposed in diametrically opposed coaxial relation to one other of said pistons relative to the central axis of said shaft,

said cam surface portions being configured to concurrently orient each of said opposed pistons in the same cycle phase through movable engagement of said cam follower means with said cam surface portions,

said valve means providing fluid communication to at least two adjacent pairs of diametrically opposed pistons at substantially all times,

whereby said shaft is subjected only to equal and opposed forces by said diametrically opposed pistons and continuous turning force during their operation and movement within said respective ones of said plurality of cylinders.

4,136,603

DIAPHRAGM ASSEMBLY

Nicholas E. Doyle, Jr., Norwood, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Nov. 14, 1977, Ser. No. 850,870
Int. Cl.[2] F01B *19/00*
U.S. Cl. 92—98 R **14 Claims**

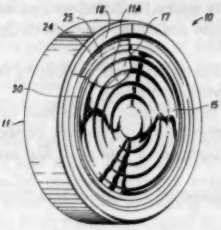
5. An improved metal diaphragm assembly particularly suitable for use in a strongly corrosive environment comprising:

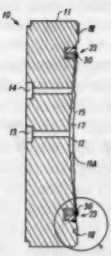
a stainless steel body including means defining a chamber therein;

a tantalum diaphragm formed to fit over said chamber, said

diaphragm being metallurgically incompatible with said body;

a transition member having a first portion of stainless steel and a second portion of tantalum molecularly bonded together;





said first portion being bonded to said body around said chamber;

said diaphragm being hermetically sealed to said second portion, thereby protecting said body from said corrosive environment.

4,136,604

METHOD AND APPARATUS FOR SEPARATING INDIVIDUAL BLANKS OF A MULTIPLE CARDBOARD BLANK

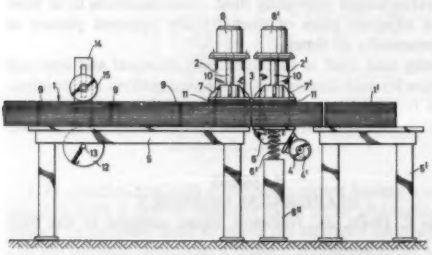
Hugo Schmidt, Düsseldorf, Germany, assignor to Feldmuhle Aktiengesellschaft, Düsseldorf-Oberkassel, Germany

Filed Aug. 30, 1977, Ser. No. 828,993

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639212

Int. Cl.² B26F *3/02*

U.S. Cl. 93—36 A **12 Claims**



1. A method of dividing each multiple blank of a plurality of multiple blanks of sheet material, each multiple blank including an individual blank integrally connected to the remainder of said multiple blank in a predetermined direction by a frangible bridge portion, which method comprises:

(a) superimposing said multiple blanks on each other in a direction transverse to said predetermined direction in such a manner that the individual blanks of said multiple blanks constitute a first stack, the remainders of said multiple blanks constitute a second stack, and said bridge portions are interposed between said stacks in superimposed relationship;

(b) fastening the individual blanks of said first stack to each other;

(c) fastening the remainders of said second stack to each other; and

(d) reciprocating one of said stacks of fastened blanks relative to the fastened blanks of the other stack in said transverse direction until the bridge portions of all said multiple blanks are broken.

4,136,605

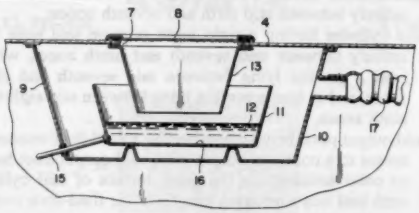
VAN ROOF VENTILATOR

Curtis D. Johnson, 38 Michael Pl., Levittown, Pa. 19057

Filed Oct. 14, 1977, Ser. No. 842,348

Int. Cl.² B60H *1/24*

U.S. Cl. 98—2.18 **3 Claims**



1. A van roof ventilator for a van having a body with a floor, a roof and sides, said van roof ventilator comprising

an opening formed through the roof of the van;

a sealed airtight air chamber affixed to the roof inside the van and completely covering an area surrounding the opening, said air chamber having a wall;

a watertight container mounted in the air chamber beneath the opening in the roof for collecting rain falling through said opening;

an exhaust hole formed through the floor of the van;

a water exhaust hose extending from the bottom of the watertight container through the wall of the air chamber in an airtight manner to the exhaust hole in the floor of the van;

an air exhaust hose extending through the wall of the air chamber in an airtight manner to an open end near the floor in the van for exhausting air from the van via the air chamber, said air exhaust hose having an opening therein near the roof of the van; and

a switch valve in the air exhaust hose at the opening therein for selectively directing cool air from the area of the floor of the van and warm air from the area of the roof of the van into the air chamber.

4,136,606

WALL MOUNTED VENTILATING DEVICE

David W. Wolbrink, Hartford, Wis., assignor to Broan Manufacturing Co., Inc., Hartford, Wis.

Filed Mar. 25, 1977, Ser. No. 781,108

Int. Cl.² F24F *7/06*

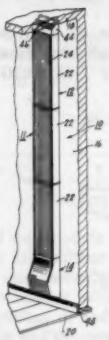
U.S. Cl. 98—33 A **15 Claims**

1. A ventilating device for a room having a ceiling, floor, and wall, said room having a stratum of hot air along the ceiling, said ventilating device comprising:

an elongated duct extending in a generally vertical direction and mountable on the wall, said duct having vertical front and back walls joined by a pair of spaced side walls, said

duct having an upper end positionable near the ceiling and a lower end; and

a blower mounted on the lower end of said duct adjacent the floor of the room, said blower including a housing having side walls, a front wall, and a back wall forming extensions of the corresponding walls of said duct, the upper portion of said front wall of said housing diverging in its downward extension out of alignment with said vertical front wall and away from the plane of the back wall of said duct, the portion of said front wall immediately below said upper portion converging in its downward extension toward the plane of the back wall of said duct to present



a surface orientatable toward the floor of the room when the duct is mounted on the wall of the room, a fan of the axial flow type mounted in said housing for drawing hot air down the duct and for imparting an increased velocity thereto, a plenum located axially in front of said fan and between said side walls of said housing for receiving the air from said fan, said plenum having a port in said converging portion of said front wall of said housing for discharging said air from said plenum into the room angularly downward toward the floor, said discharge port having means to project the discharged air into the room in a laminar flow.

4,136,607

TOASTER WITH BI-METAL CONTROLS

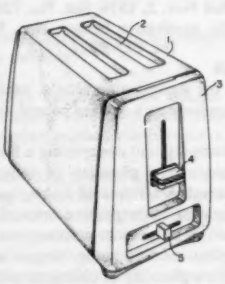
Masaru Mitsuo, Minoo, and Sigeharu Isayama, Osaka, both of Japan, assignors to Toyo Press Co., Ltd. and Matsushita Electric Industrial Co., Ltd., both of Osaka, Japan

Filed Aug. 8, 1977, Ser. No. 822,644

Claims priority, application Japan, Oct. 5, 1976, 51-120099; Oct. 5, 1976, 51-120100

Int. Cl.[2] A47J *37/08*

U.S. Cl. 99—329 R **10 Claims**



1. A toaster comprising a toaster body defining a bread toasting chamber, vertically movable means normally urged upwardly under the action of resilient means and connected to a bread supporter vertically movable within said bread toasting chamber, anchoring means for holding said vertically movable means in a bread toasting position, a bi-metal element for sensing the temperature of said bread toasting chamber, temperature control means for adjusting the position of said bi-metal element to achieve desired toasting of the bread and releasing means responsive to displacement of said bi-metal element to release the holding of the vertically movable means by the anchoring means; characterized in that said bi-metal element is secured to a bi-metal element supporting member pivotably mounted at its upper end on said toaster body, said bi-metal support member being connected to the bread supporter interlocked with the vertically movable means to vertically move within said bread toasting chamber, and said bread supporter being interlocked with said temperature control means to move in a horizontal direction upon movement of said temperature control means thereby pivoting said bi-metal element supporting member to displace said bi-metal element and adjust the toasting of the bread.

4,136,608

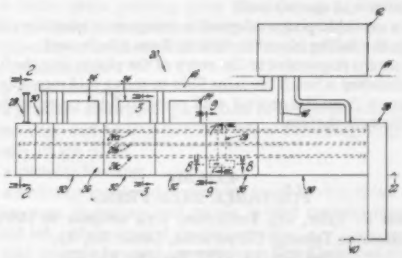
SYSTEM FOR PROCESSING MEAT

Andrew J. Gladd, Northville; Andrew Gladd, Jr., Livonia, and Ralph J. MacKay, Novi, all of Mich., assignors to Gladd Industries, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 658,203, Feb. 17, 1976, abandoned. This application Nov. 29, 1976, Ser. No. 745,707

Int. Cl.[2] A23B *4/04*

U.S. Cl. 99—476 **22 Claims**



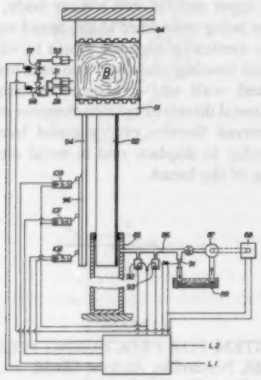
1. In an elongated meat processing system including a housing defining at least one treatment zone for processing meat or the like and a conveyor for conveying products to be processed through the treatment zone, an improved lifting mechanism for lifting products from the conveyor comprising: laterally spaced lifters between which the conveyor carries products to be processed through the treatment zone; each lifter being movable from a first position to a second position to lift products from the conveyor within the treatment zone and being movable from the second position back to the first position to return the lifted products to the conveyor; a rotatably supported elongated control member extending laterally with respect to the conveyor between the lifters at each side thereof and having crank arms respectively connected to the lifters so as to coordinate the movement of the lifters between the first and second positions; an actuator for rotating the control member about the elongated extent thereof to move the lifters between the first and second positions while the control member is loaded in a torsional mode; said actuator being spaced laterally with respect to the conveyor at one side thereof such that the space above the conveyor is not obstructed by the actuator; and a gas circulator for supplying circulating gas to the treatment zone and being located immediately over the upper extremity of the treatment zone.

4,136,609

BALING PRESS CONTROLS

Donald W. Van Doorn; James B. Hawkins; Roy T. Williams, and William C. Pease, III, all of Columbus, Ga., assignors to Lummus Industries, Inc., Columbus, Ga.

Filed Oct. 11, 1977, Ser. No. 840,658
Int. Cl.[2] B30B *15/18*
U.S. Cl. 100—51 **4 Claims**



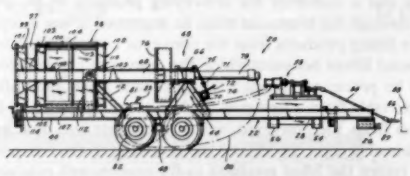
1. In apparatus for baling fibers,
(a) a baling chamber defined in part by at least one wall which is mounted for movement from a first position relative to an opposite wall to a second position farther from said second wall,
(b) a movable platen adapted to compress a quantity of fiber in the baling chamber thus to form a bale, and
(c) means responsive to the entry of the platen into the baling chamber when it contains fiber to move said movable wall away from the second wall prior to final compression of the bale therein.

4,136,610

PORTABLE BALE PRESS

William R. Tyler, Jr., Lexington, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Sep. 12, 1977, Ser. No. 832,625
Int. Cl.[2] B30B *15/32*
U.S. Cl. 100—100 **18 Claims**



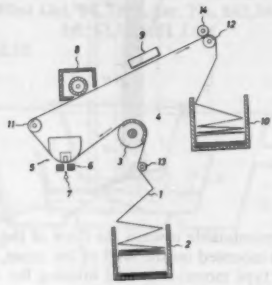
1. A portable bale press for tobacco and the like comprising; a transportable support, a movable frame pivotally mounted on the support to rotate between a substantially horizontal inactive position on the support and a substantially vertical active position on the support with compression chamber and a press head which is drivable into the compression chamber to form a compressed mass of tobacco in the compression chamber, power means for driving the press head, the frame supporting the compression chamber and the press head being shiftable between an inactive position for transportation of the bale press and an active position where the compression chamber and the press head are in position for compression of tobacco, and releasable holding and shifting means for transferring the frame between positions and holding the frame in the active and inactive positions for tobacco compression and transportation of the bale press respectively, the shifting means including a winch mounted on the support, the winch including a cable mounted to the frame so that rotation of the winch to reel the cable will shift the frame to the inactive position and unreeling of the cable permits the frame to shift to the active position.

4,136,611

ELECTROSTATIC PRINTING DIRECTLY ONTO PAPER

Akinori Watanabe; Akio Nagano, and Katsuhide Tanoshima, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1977, Ser. No. 809,055
Claims priority, application Japan, Jun. 25, 1976, 51/74405
Int. Cl.[2] G03F *7/16*; G03G *5/10, 15/12, 15/22*
U.S. Cl. 101—1 **4 Claims**



1. A high speed printer for obtaining visual images of figures on paper by developing and fixing electrostatic images or figures of characters, numerals, symbols, etc. after forming them, comprising in order, means for drying said paper prior to forming an image thereon, means for forming an electrostatic image on said paper, means for depositing visible grains on said electrostatic image for development thereof, and means for fixing said visible grains to said paper, said drying means comprising a heating drum formed of a semi-cylindrical heating plate including a heater for drying the paper and a semi-cylindrical non-heating part, said semi-cylindrical heating plate mating with said semi-cylindrical non-heating part to form said heating drum.

4,136,612

APPARATUS FOR STAMPING ARTICLES, ESPECIALLY METAL SHEETS

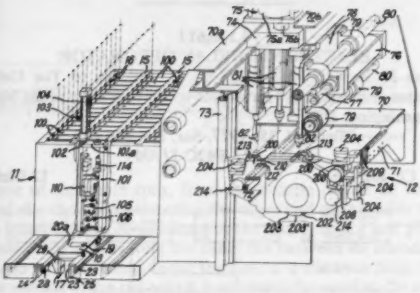
Dominique D. Daguise, Chevillon, France, assignor to Societe Anonyme dite: Au Cachet Lorrain, Metz, France

Filed Nov. 2, 1976, Ser. No. 738,008
Claims priority, application France, Nov. 3, 1975, 75 33572
Int. Cl.[2] B41J *7/78*
U.S. Cl. 101—18 **21 Claims**

1. Apparatus for stamping an article, such as a metal sheet, by printing characters on a surface of said article, said apparatus including:
at least one stamping unit comprising a frame provided with guide means and a plurality of independent stamping modules mounted within said frame, each stamping module being guided by respective ones of said guide means for translational movement with respect to said frame, and each stamping module comprising a movable character support with a plurality of character positions at least one of which includes a character thereon, drive means for driving said support with respect to its associated module and stop means for stopping and immobilizing said support;
preselecting means, having an input unit and being con-

nected to said stop means of each stamping module for bringing a character position of each character support into a stamping position facing said surface to be printed; and

means for individually actuating each character support by translationally moving each stamping module independently of any other stamping module from a rest position,



wherein a character of this module placed in stamping position is spaced from said surface to be printed, to a work position, wherein said character placed in stamping position is brought into contact with said surface to be printed, whereby the strokes of said stamping modules between the rest position and the work position are variable independently from each other, and in accordance with the relief contour of the surface to be printed.

4,136,613

FIXING APPARATUS FOR ELECTROSTATIC PHOTOGRAPHY

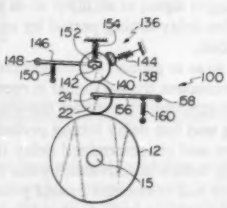
Ryoichi Namiki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 22, 1976, Ser. No. 679,290

Claims priority, application Japan, Apr. 30, 1975, 50/52145

Int. Cl.² B05C *11/00*

U.S. Cl. 118—60 **6 Claims**



1. An electrophotographic apparatus comprising:

a rotating fixing member;

a transfer roller;

an applicator roller having a shaft coaxial therewith and pressed into contact with the transfer roller;

an applicator member pressed into contact with the applicator roller;

a friction member being pressed against the shaft by a compression spring to provide a frictional resistance thereto;

first biasing means for pressing the transfer roller and the fixing member together with a force F_1; and

second biasing means for pressing the transfer roller and the applicator roller together with a force F_2, the second biasing means comprising a lever pivotal about a fixed fulcrum and a spring urging the lever into pressing engagement with the shaft, the force F_1 being greater than the force F_2, the forces F_1 and F_2 being selected so that the transfer roller is driven for rotation by the fixing member against the friction force between the transfer roller and the applicator roller when the coefficient of friction between the transfer roller and the fixing member is above a predetermined value and the transfer roller is held against rotation by the friction force between the transfer roller and the applicator roller when the coefficient of friction between the transfer roller and the fixing member is below the predetermined value, the surface energy of the fixing member being smaller than the surface energy of the transfer roller which is smaller than the surface energy of the applicator roller.

4,136,614

LETTERPRESS PRINTING PRESS

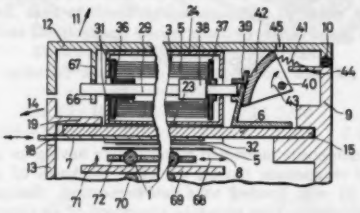
Werner Wüthrich, Gümligen, Switzerland, assignor to Autelca AG, Switzerland

Filed Dec. 10, 1976, Ser. No. 749,415

Claims priority, application Switzerland, Dec. 11, 1975, 16076/75

Int. Cl.² B41F *31/00*; B41J *31/00*; B41F *3/00*

U.S. Cl. 101—274 **7 Claims**



1. A letter press printing press for printing a plurality of indicia on a sheet with an interchangeable printing form carrying a plurality of embossed indicia and an ink ribbon comprising in combination:

(a) a press housing;

(b) a pressure absorption plate fixed in said press housing on one edge and having two free edges extending longitudinally of the press;

(c) a cassette housing;

(d) a delivery spool and a wind-up spool having spool rotation axes mounting said spools in said cassette housing, said ink ribbon wound on said spools;

(e) said cassette housing comprising a first U-shaped profile wall having side longitudinal U-section flanges extending from a web, and a second wall disposed inside said first U-shaped profile wall and having two flanges which are parallel spaced from said first wall flanges and which have free edges, said delivery spool and said wind-up spool disposed inside said first U-shaped profile wall with said spool rotation axes parallel to the longitudinal direction of said flanges, said web of said first wall and the section of said second wall between said flanges enclosing said spools, said ink ribbon extending from said delivery spool in the space between the one said parallel spaced flanges of said first and second wall and in self-supporting relation from said free edge of the one said second wall flange to said free edge of the other said second wall flange and in the space between the other said parallel spaced flanges of said first and second wall to said wind-up spool, the self-supporting portion of the ink ribbon extending parallel to said web of said first U-shaped profile wall;

(f) said cassette housing being removable from and insertable in the press housing parallel to to said web of said first wall, said absorption plate being disposed between said second wall of said cassette housing and said self-supporting portion of said ink ribbon and parallel thereto;

(g) at least one pressure element being arranged in said press housing at the other side of said pressure absorption plate,

opposite to said second wall of said cassette housing and movable between an inactive position and a printing position for the purpose of in the inactive position inserting and removing said printing form and said sheet between the pressure absorption plate, said self-supporting portion of the ink ribbon and the at least one pressure element, and in the printing position pressing together and against said pressure absorption plate, the printing form, the self-supporting portion of the ink ribbon and the sheet.

4,136,615

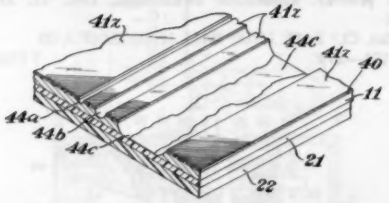
PATTERN PLATE OF COMPOSITE STRUCTURE

Norman J. Pozniak, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 652,601, Jan. 26, 1976, abandoned. This application Sep. 23, 1977, Ser. No. 835,929

Int. Cl.² B41N *1/06*; B41C *1/02*

U.S. Cl. 101—401.1 **1 Claim**



1. A composite laminated pattern plate having an etchable sheet of magnesium having unetched thickness of approximately 30 mils bonded to a self-supporting, dimensionally stable, all-plastic base structure composed of an intermediate layer of adhesive copolymer of ethylene and acrylic acid, which intermediate layer has substantially uniform thickness in the approximate range from 0.5 to 2 mils, and a backing sheet of poly(ethylene terephthalate) having substantially uniform thickness in the approximate range from 2 to 5 mils.

4,136,616

CARTRIDGE FOR HAND AND SHOULDER FIREARMS

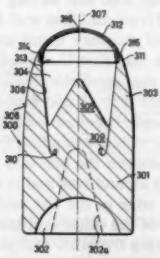
Hans-Ludwig Schirneker, Engelslit 10, D-4773 Mohnesee-Vollinghausen, Fed. Rep. of Germany

Filed Aug. 9, 1976, Ser. No. 712,665

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1975, 2535704; Sep. 18, 1975, 2541632; Dec. 17, 1975, 2556744; Jun. 11, 1976, 2626219

Int. Cl.² F42B *11/10, 5/02*

U.S. Cl. 102—38 R **14 Claims**



1. A cartridge for hand firearms and shoulder arms, comprising a cartridge case containing powder and a fuse, and a projectile inserted in said case, said projectile comprising a substantially cylindrical main body of hard material such as iron, tombac or copper, said body including a forwardly projecting annular rim portion which defines a central cavity and which mushrooms out upon the projectile striking the target, the leading end of said rim portion being constructed to form a shoulder, a convex cap at the front of said projectile and closing said cavity, said cap engaging and being supported by said shoulder, and a central projecting, generally pointed tip integral with said body and extending into said cavity, said cap remaining essentially intact and being pushed into said cavity so that said cap is fixed to said tip upon the projectile striking a target.

4,136,617

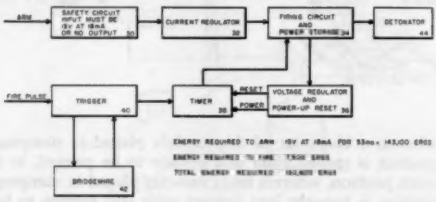
ELECTRONIC DELAY DETONATOR

Steven E. Fowler, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 18, 1977, Ser. No. 816,415

Int. Cl.² F42C *11/06*

U.S. Cl. 102—220 **12 Claims**



1. An electronic delay detonator fired by a trigger signal comprising:

a safety circuit with output current for arming the detonator;

a current regulator electrically connected to said safety circuit output for limiting the current from the safety circuit output so as to produce a current output from said current regulator which cannot cause overloads;

a power storage circuit which inputs said current regulator output for holding in reserve the energy delivered by said regulated current;

a power-up reset circuit which receives as input the output of the current regulator for providing an initial timing signal;

a trigger circuit connected to the power-up reset circuit and has said trigger signal as an input so as to initiate a predetermined fire delay timing period by an output from said trigger circuit;

a fuse placed so as to ground the trigger circuit until a predetermined minimum trigger signal is received;

a time delay circuit which receives the trigger circuit output for causing said fire delay timing period and outputting a signal when said predetermined delay time has passed;

a firing circuit which is activated by the output of the time delay circuit and connected to said power storage circuit for releasing said energy reserve in said power storage circuit; and

a detonator which receives said released energy for firing said detonator.

4,136,618

RAILROAD LIFTING DEVICE FOR BALLAST CLEANING AND LEVELLING MACHINES

Jean-Jacques Boyer, Montchauvet, France

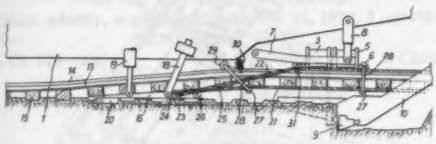
Filed Jun. 6, 1977, Ser. No. 804,153

Int. Cl.² E01B *29/04, 27/02, 27/06*

U.S. Cl. 104—7 R **4 Claims**

1. A ballast cleaning and levelling machine for railroad tracks comprising at least a track lifting device which lifts the rail and ties by acting on the rails, said machine carrying in front of the lifting device as such a shoe which is at least engaged under the end of the ties between a point which is exterior but neighboring the end of the tie and a point situated inside in relation to said end, the shoe having a wedge-shaped

vertical cross-section and a forwardly downwardly inclined upper surface that engages the underside of the ties to lift the ties, said shoe being carried by elements which are integral with the machine frame and extend beyond the tie ends, an endless cable and a guiding device for said endless cable comprising front and rear guiding means for respectively introduc-



ing one of the cable runs, from the outside of the tie ends, behind the shoe and extracting the other end of the cable run from under the ties downstream of the lifting device and guiding means for maintaining the cable run between its introduction and its extraction, under the ties, at a distance from the upper surface of the rail which is substantially equal to the sum of the rail height and the ties thickness.

4,136,619

CARRIAGE FOR CONTAINER TRANSPORT AND TRANSFER PLANT FOR CONTAINERS

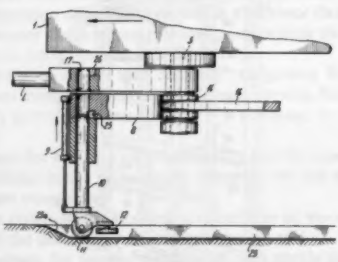
Gerhardus J. Wormmeester, Zwijndrecht, and Joannes C. Rijsenbrij, Boskoop, both of Netherlands, assignors to Europe Container Terminus B.V., Rotterdam, Netherlands

Filed Jun. 8, 1977, Ser. No. 804,798

Claims priority, application Netherlands, Jun. 9, 1976, 7606231

Int. Cl.[2] B62D *13/04*

U.S. Cl. 104—244.1 **6 Claims**



4. A transport carriage adaptable for use with a vehicular train in a transfer conveying system having both a conveying region with carriage guide rails and a conveying region without carriage guide rails, said transport carriage comprising:

(a) a carriage member;

(b) a pair of front wheels rotatably mounted to said carriage member;

a pair of rear-wheels rotatably mounted to said carriage member; and

(d) means for selectively steering said carriage on said carriage guide rails and without said carriage guide rails, said steering means including

(i) a pole for connecting the carriage to another member of the vehicular train and for imparting a steering movement to the carriage when the carriage is in the conveying region without guide rails;

(ii) at least one guide roller for imparting a steering movement to the carriage when the roller is contacting the carriage guide rails of the transfer conveying system;

(iii) a guiding arm rotatably mounted to said carriage member about a vertical axis, operatively coupled to the guide roller and selectively coupled to said pole for receiving steering movement when the carriage is in the conveying region without guide rails, and wherein said at least one guide roller contacts the carriage guide rails when said guide arm is decoupled from said pole for alternatively imparting steering movement to said guide arm;

(iv) a first transmission operatively connecting said guiding arm to said front-wheel pair; and

(v) a second transmission operatively connecting said front-wheel pair and rear-wheel pair.

4,136,620

SELF STEERING RAILWAY TRUCK

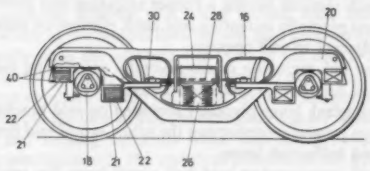
Herbert Scheffel, Pretoria, and Rowlen E. von Gericke, Kempton Park, both of South Africa, assignors to South African Inventions Development Corporation, Pretoria, South Africa

Filed Jul. 2, 1976, Ser. No. 701,775

Claims priority, application South Africa, Jul. 14, 1975, 75/4505

Int. Cl.[2] B61F *3/08, 5/06, 5/32, 5/38*

U.S. Cl. 105—168 **7 Claims**

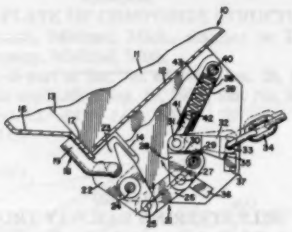


1. A load-carrying railway truck having a longitudinal axis in its direction of travel and including a load-bearing structure; a pair of live-axle wheelsets each comprising a pair of wheels solidly mounted on an axle and supporting the load-bearing structure through axle bearings mounted on each axle, load-transmitting means for each axle bearing including an adaptor means seated on the bearing and having flanges straddling the bearing, and an elastic element between each adaptor flange and the load-bearing structure, with each wheel tread being profiled to a high effective conicity to generate steering forces by the conical tread independently of the wheel flange and the elastic elements providing constraints against longitudinal movement of each wheelset with respect to the load-bearing structure which are lower than the steering forces whereby each wheelset is substantially self-steering; and means interconnecting the wheelsets to couple yawing movements of each wheelset in opposite sense to the other wheelset, the interconnecting means comprising a first extension secured to an adaptor on the first wheelset, an identical extension being secured to a diagonally opposite adaptor on the second wheelset, an anchor means extending diagonally across the truck pivotally connected to the free ends of the first and second extensions; each of the elastic elements comprising a first member resilient in the lateral and longitudinal directions of the truck and an elongate second member having an arcuate surface in vertical load supporting engagement with the first member, each elastic element being disposed on an adaptor flange with the principal axis of the second member parallel to the longitudinal axis of the truck whereby each elastic element provides a resilient constraint in a direction transverse to the longitudinal axis of the truck which is lower than the resilient constraint in a direction parallel to the longitudinal axis of the truck.

4,136,621
RAILWAY HOPPER CAR DOOR LOCKING MECHANISM

James J. Schuller, Crete, Ill.; William Raksanyi, Hammond, Ind., and Ray L. Ferris, Thornton, Ill., assignors to Pullman Incorporated, Chicago, Ill.

Filed Apr. 11, 1977, Ser. No. 786,531
Int. Cl.[2] B61D 7/02, 7/18, 7/26, 49/00
U.S. Cl. 105—308 E 14 Claims



1. In a hopper arrangement having a wall structure including a discharge opening, a downwardly swinging hopper door connected to said wall structure for opening and closing said discharge opening, the improvement comprising an over-center locking mechanism for said arrangement comprising;

a lock support bracket connected to said wall structure,

a keeper member on said door,

a latch element having a keeper engaging end portion,

means pivotally mounting said latch element on said bracket adjacent to said opening,

a first link including means pivotally connecting one end of said first link to said latch element,

a bell crank lever pivotally mounted on said bracket,

means pivotally connecting the other end of said first link to said bell crank lever,

means connected to said bell crank lever for rotating the same to move the latch element through said first link between locking and unlocking engagement relative to said keeper, and

the pivotal connection of said first link to said bell crank lever being movable to a latch locking, limiting over-center position relative to the pivotal connection of said first link to said latch element to secure said keeper engaging end portion in locking engagement with said keeper member.

4,136,622
FOLDING WALL TABLE

Richard C. Bue, Chaska, and Casey L. Carlson, Minneapolis, both of Minn., assignors to Sico Incorporated, Minneapolis, Minn.

Continuation-in-part of Ser. No. 760,851, Jan. 21, 1977, Pat. No. 4,100,858. This application May 4, 1977, Ser. No. 793,599
Int. Cl.[2] A47B 5/00
U.S. Cl. 108—48 10 Claims

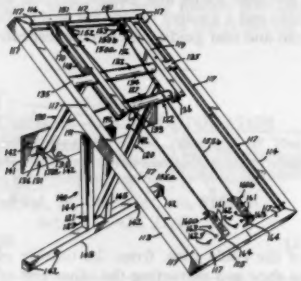
1. A folding wall table adapted for attachment to a wall for movement between a storage position vertically disposed adjacent the wall and a usable position horizontally extending from the wall, comprising:

a table surface member;

a wall mounting plate for attachment to a wall;

hinge means connecting said table surface member to said wall mounting plate for movement between said usable and storage positions so that the inner edge of the table, nearest the wall in the usable position, is the uppermost edge in the storage position; and

first and second latch means connected respectively to said table surface member adjacent said inner edge thereof and to said wall mounting plate, said latch means for securing

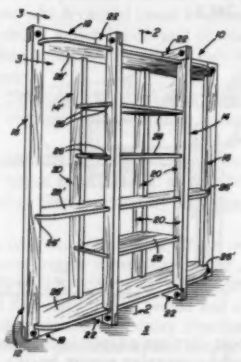


said inner edge of said table surface to said wall mounting plate when the table is in its usable position.

4,136,623
FURNITURE CONSTRUCTION

Billy R. Dickson, 3313 Marzelle, Houston, Tex. 77093

Filed Oct. 31, 1977, Ser. No. 847,028
Int. Cl.[2] A47B 3/00
U.S. Cl. 108—111 5 Claims



1. A furniture construction, comprising, in combination:

(a) a planar first frame; and

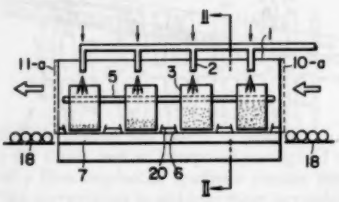
(b) a planar second frame attached to the first frame, and arranged with the plane of the first frame substantially perpendicular to the plane of the second frame, each of the first frame and second frame being a rectangular framework comprising two pairs of substantially parallel, longitudinally extending elements disposed perpendicular to one another and connected together at longitudinally spaced ends thereof to form an integral unit, one of the pairs of elements of each frame crossing the other frame at substantially a right angle and in common planes, there being a pair of second frames, each of the second frames being arranged substantially perpendicular to the first frame and substantially parallel to and spaced from the other of the second frames, the latter having extents transverse of the first frame substantially equal and less than half the extent of the first frame perpendicular to the extent of the second frames, the second frames being spaced symmetrically along the extent of the first frame.

4,136,624

INCINERATOR FOR REFUSE IN CONTAINERS AND METHOD OF INCINERATION THEREFOR

Nobuhide Kato, Niihama; Ryo Yasuno, and Susumu Yajima, both of Fujieda, all of Japan, assignors to Sumitomo Durez Co., Ltd, Tokyo and Kabushiki Kaisha Niihama Tekkojo, Ehimeken, both of, Japan

Filed Jul. 7, 1977, Ser. No. 813,472
Claims priority, application Japan, Jul. 12, 1976, 51-81950
Int. Cl.[2] F23G *7/00*
U.S. Cl. 110—236 4 Claims



1. Apparatus by which refuse in an open-topped container can be completely incinerated without being removed from the container, said apparatus comprising:

A. a receiver dish upon which the container can rest with its open top uppermost, said receiver dish being large enough to have marginal portions that extend beyond a container thereon for receiving material that falls down alongside the container;

B. means defining a closed incineration chamber having at least one door through which the receiver dish with a container thereon can be moved into and out of the incineration chamber;

C. liquid cooled supporting means in the interior of the incineration chamber upon which a receiver dish having a container thereon can rest and upon which the receiver dish is readily movable horizontally;

D. burner means in said chamber comprising fuel nozzle means located and arranged to guide burning fuel substantially laterally against the side of a container in the chamber;

E. means for blowing air downwardly into the open top of a container in the incineration chamber, the last mentioned means comprising

(1) a downwardly opening air nozzle in an upper portion of the incineration chamber interior; and

(2) means for forcing air through said nozzle at a rate to cause a substantial stream of air to be projected downwardly therefrom;

F. said incineration chamber has a length to contain a substantially aligned plurality of receiver dishes, each with a container thereon, further characterized by:

(1) said burner means comprising a plurality of fuel nozzles spaced from one another along the length of the chamber;

(2) a plurality of air nozzles spaced from one another along the length of the chamber, and

(3) said chamber having doors at both ends thereof to permit receiver dishes and the containers they carry to move through the chamber in one direction, entering the chamber at one end thereof and leaving it at its other end;

G. means linking a plurality of receiver dishes with one another, chain-fashion, and means for advancing the linked receiver dishes stepwise into, through and out of the incineration chamber; and

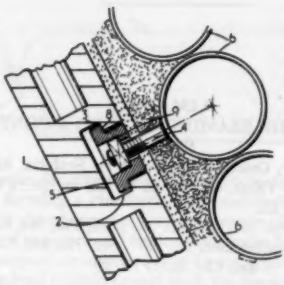
H. said liquid cooled supporting means comprises liquid cooled pipes fixed in substantially closely spaced relation and in a common horizontal plane, upon which receiver dishes can slide.

4,136,625

FLAME INJECTION THROATS FOR FURNACES

John S. Corbet, Bearsden, Scotland; John Basford, Stoke-on-Trent, and James R. Hemming, Solihull, both of England, assignors to Poulton & Son (Refractories) Limited, Staffordshire, England

Filed Jun. 7, 1977, Ser. No. 804,399
Claims priority, application United Kingdom, Jun. 11, 1976, 24242/76
Int. Cl.[2] F23M *5/04*
U.S. Cl. 431—336 10 Claims



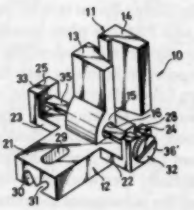
1. A flame injection throat for a furnace comprising a furnace structure having an opening and at least one ring of refractory tiles lining the inner face of the opening forming the flame injection throat, the adjacent edge portions of the outer faces of selected adjacent tiles being formed with undercut grooves wider at the bottom than the top, said grooves extending inwardly from the adjacent end faces of the tiles in alignment with one another, pins having enlarged ends attached to the furnace structure within the throat opening and projecting into grooves in the tiles so that the enlarged ends are within the grooves and locking members fitted into the grooves and engaging simultaneously the undercut portions of the grooves in the tiles and the enlarged ends of the pins whereby to hold the tiles to the pins each of said locking members being a block of heat-resisting metal bifurcated along a portion of its length whereby to present two limbs arranged when fitted into a groove in a tile to straddle a pin projecting into the groove and simultaneously engage the undercut portion of the groove.

4,136,626

PRESSER FOOT

Akiyoshi Kandou, Uozu, and Kiyoo Yoneya, Kurobe, both of Japan, assignors to Yoshida Kogyo K K, Chiyoda, Japan

Filed Jun. 21, 1977, Ser. No. 808,526
Claims priority, application Japan, Jun. 22, 1976, 51-81697[U]
Int. Cl.[2] D05B *29/00*
U.S. Cl. 112—235 6 Claims



1. A presser foot for a sewing machine comprising:

a stem member for attachment to a sewing machine bar, said stem member having a groove defined therein partly by a wall;

a sole member including a pair of spaced lugs having a pair of holes therein, respectively; and

a pin member having a pair of spaced journals and a strip provided therebetween, said journals being pivotally supported in said holes, said strip extending through said groove, and said strip having an edge forcibly engageable with said wall upon pivotal movement of said pin member about its axis through an angle, to thereby retain said pin member against axial displacement relative to said stem member.

4,136,627

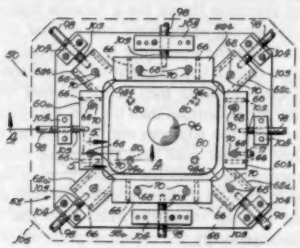
APPARATUS FOR SEAMING A LID TO A CONTAINER PAN

Roland E. Miller, Orangeville; Joseph A. Scaletta, Mt. Prospect, and John Valek, Cicero, all of Ill., assignors to Kraft, Inc., Glenview, Ill.

Division of Ser. No. 707,754, Jul. 22, 1976, Pat. No. 4,088,086. This application Dec. 22, 1977, Ser. No. 863,520

Int. Cl.[2] B21D *19/00*

U.S. Cl. 113—18 A **8 Claims**



1. A system for securing a lid to a container pan wherein the lid has a peripheral marginal surface the outer marginal edge of which is formed into a depending lip, and wherein the pan has an upstanding wall the upper edge of which forms an outwardly directed flange which lies in a plane substantially perpendicular to said upstanding wall, said lid being disposed on said pan with said marginal surface overlying said flange and with said depending lip disposed outwardly of and extending below the plane of said flange, said system comprising, first die means including a die fixture adapted to receive and support said pan and complementary lid, said first die means further including seam forming plate means supported peripherally of said pan and lid and movable in a plane substantially perpendicular to said depending lip on said lid, and means operatively associated with said forming plate means to effect movement thereof so as to engage said depending lip and form it into underlying juxtaposed relation to said flange, and second die means including a lower die set adapted to receive and support said pan and rim after forming said lip into said underlying juxtaposed relation to said flange, said second die means including final seam forming supported for movement in a first direction substantially perpendicular to said outwardly directed flange and for subsequent movement in a second direction substantially perpendicular to said upstanding wall of said pan, and means for effecting said movements of said seam forming die means to, firstly, form said flange and juxtaposed lip against said upstanding wall, and, secondly, press the juxtaposed thicknesses of said flange, marginal surface of said lid, and said lip against said upstanding wall to complete said double seam.

4,136,628

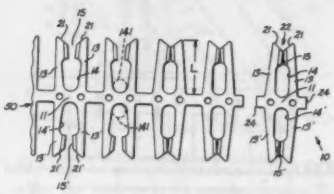
METHODS OF AND APPARATUS FOR MAKING SLOTTED BEAM CONTACT ELEMENTS

Charles McGonigal, Grayson, and James E. Voytko, Atlanta, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 710,358, Jul. 30, 1976, abandoned. This application Aug. 8, 1977, Ser. No. 822,969

Int. Cl.[2] B21D *53/00*

U.S. Cl. 113—119 **10 Claims**



1. A method of making a slotted beam contact element, which comprises steps of:

forming an opening in a metallic strip;

applying forces to at least one portion of the strip adjacent the opening to reshape said portion;

forming a bifurcated beam in the strip with at least portions of the furcations of the beam encompassing the opening; and

moving the furcations toward each other to cause the portions encompassing the opening to define a slot of predetermined width characteristics suitable for receiving a conductor and for establishing electrical contact between the furcations and the conductor.

4,136,629

METHOD OF PRODUCING CAN COVERS AND CAN COVERS OBTAINED THEREBY

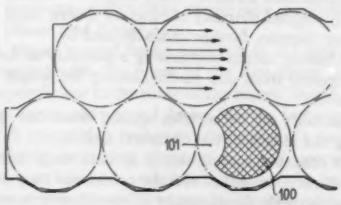
Rudolf Lüthi, Niederwangen, Switzerland, assignor to Styner & Bienz A.G., Niederwangen, Switzerland

Filed Jun. 7, 1977, Ser. No. 804,366

Claims priority, application Switzerland, Jun. 14, 1976, 7491/76; Dec. 9, 1976, 15485/76

Int. Cl.[2] B21D *51/44*

U.S. Cl. 113—121 C **10 Claims**



1. A method for producing a cover for an easy-open tin, can or the like, wherein a cover blank is punched from the cover material, said blank being introduced into an apparatus for embossing a weakening score therein, and is aligned in accordance with its grain direction whereby said weakening score is made deeper in the portions extending transverse to the grain direction than in the portions extending parallel to the grain direction.

4,136,630

SAIL BATTEN

Ian K. Fraser, Bracken, Cosawes, Perranarworthal, Truro, Cornwall, England

Division of Ser. No. 699,077, Jun. 23, 1976, abandoned. This application Dec. 21, 1977, Ser. No. 862,965

Claims priority, application United Kingdom, Jun. 26, 1975, 27101/75

Int. Cl.[2] B63H 9/06

U.S. Cl. 114—102 1 Claim

1. A flexible tapered sail batten, comprising two external generally flat sheets, and an interposed corrugated core sheet, formed of a fibre reinforced synthetic plastics material, the depth of the corrugations in said core sheet increasing progressively from end to end of said sheet, and the two external sheets being bonded to the peaks of said corrugations, the batten being elongated and the corrugations being transverse to the length of the batten.

4,136,631

PORTABLE SAIL STRUCTURES

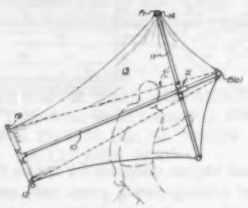
Allan Nimchuk, 4228-15a St. SW., Calgary, Alberta, Canada

Filed Jun. 20, 1977, Ser. No. 807,817

Claims priority, application Canada, Jun. 24, 1976, 255644

Int. Cl.[2] B63H 9/04

U.S. Cl. 114—103 5 Claims



1. A folding sail assembly comprising:

(a) a supporting frame including:

(i) a main mast;

(ii) a pair of boom members attached to said mast intermediate its length by coupling means such that said boom members are pivotable about said coupling means between an inoperative position wherein said members lie adjacent and substantially parallel with said mast and an operative position wherein said members extend at an angle relative to said mast said coupling means being slidable along said mast for facilitating shifting of said boom members between said inoperative and operative positions;

(iii) spring loaded said retention members adjacent each distal end of said mast and said boom members, and attached thereto; and

(b) a sail member stretched about said frame and releasably secured to said mast and boom members by engagement with said retention members whereby when said sail assembly is subjected to external forces likely to cause injury, said sail member will be released from said retention members and said boom members will collapse to said inoperative position.

4,136,632

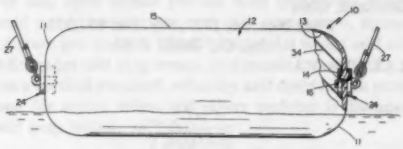
MARINE FENDER

John T. Day, Winfield; Robert O. Herder, Easton, both of Md.; Thomas N. Blockwick, McLean, Va.; Dan B. Brockman, Cohasset, Mass.; John F. Sharpe, Mansfield, Mass., and Richard W. Hildebrand, Lowell, Mass., assignors to Ocean Systems, Inc., Houston, Tex. and Rubber Millers, Inc., Baltimore, Md.

Filed Sep. 16, 1977, Ser. No. 833,753

Int. Cl.[2] B63B 59/02

U.S. Cl. 114—220 7 Claims



1. A fender for marine use of the type having an outer flexible shell forming a chamber, compressible buoyant material within said chamber and at least one mooring fitting connected to said shell to secure said fender, said fender being free of rigid internal support structure so that forces applied to said fitting are transmitted entirely to said shell, the improvement wherein

the shell of said fender is composed of an integral piece of homogeneous elastomeric material, said shell having a thickened annularly shaped lip of the same material as and integral with said shell, said lip extending around an orifice providing access to said chamber for filling,

said mooring fitting being formed to have a cavity and said lip of said shell being captured within said cavity to secure said fitting to said shell,

said elastomeric shell permitting stretching of said fender when it is pinned between two objects while a tensile force is applied to said mooring fitting,

said mooring fitting capturing said lip without compressing it, so that the adjacent surfaces of said lip and said fitting may swivel with respect to one another while said fitting still remains secured to said shell.

4,136,633

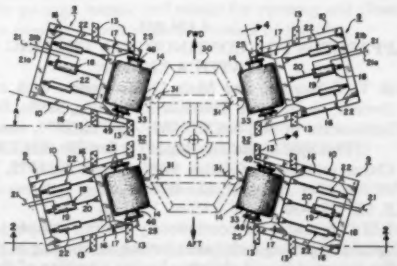
DEVICE FOR RESTRAINING LATERAL MOVEMENT OF SUBSEA EQUIPMENT

Joseph F. Homer; John L. Glaeser, and Robert P. Bright, all of Anchorage, Ak., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jun. 6, 1977, Ser. No. 803,816

Int. Cl.[2] B63B 35/44

U.S. Cl. 114—264 4 Claims



1. A device for restraining movement of a blowout preventor stack when moving said apparatus through the well of a floating vessel comprising:

a plurality of angularly spaced-apart means secured to said vessel for engaging and restraining lateral movement of said stack;

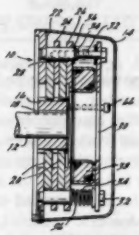
each of said spaced-apart means including:
a rigid frame assembly connected to said vessel;
a roller mounted for slidable movement on said frame assembly and capable of rolling along the surface of said stack;
shock absorber means connecting said roller and said frame assembly; and
actuator means connected to said roller for moving said roller into and away from engagement with said stack.

4,136,634

HOIST BRAKE WEAR INDICATOR

Walter Wilson, Westland, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 14, 1977, Ser. No. 851,239
Int. Cl.² B66D 5/30
U.S. Cl. 188—1 A **3 Claims**



1. A brake adapted to stop the rotation of a driving shaft comprising:
at least one friction disc attached to said shaft and extending radially therefrom, said friction disc adapted for rotation with said shaft and having limited longitudinal movement along said shaft;
at least one annular friction member radially disposed about the shaft and adapted to move longitudinally along said shaft but rigidly mounted with respect to rotation and normally biased into engagement with said friction disc;
a rigidly mounted magnet backing plate separated from said annular friction member;
an electromagnet mounted on said magnet backing plate and adapted to move said annular friction member out of contact with said friction disc; and
a wear indicator attached to said annular friction member and said magnet backing plate, said wear indicator measuring the gap between said annular friction member and said electromagnet and externally indicating the gap present to show the amount of wear on the annular friction member and friction disc said gap increasing in size with wear.

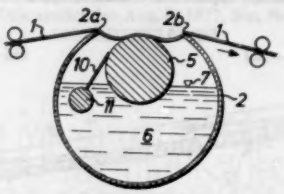
4,136,635

APPARATUS FOR CONTINUOUSLY COATING A WEB WITH A LIQUID

Erik V. Johansson, and Mats O. Kullander, both of Säffle, Sweden, assignors to Billeruds Aktiebolag, Säffle, Sweden

Continuation of Ser. No. 677,289, Apr. 15, 1976, abandoned.
This application Jul. 11, 1977, Ser. No. 814,728
Claims priority, application Sweden, Apr. 28, 1975, 7504872
Int. Cl.² B05C 1/08
U.S. Cl. 118—50 **2 Claims**

1. An apparatus for continuously coating a paper web with a liquid comprising a chamber having an opening in its wall; a roller mounted in said chamber having a portion of the surface of said roller situated in said opening and spaced from an edge of the opening in the wall of the chamber which is downstream from the roller; means for continuously passing a paper web past said chamber while covering said opening; means connected to the chamber for creating a vacuum in said chamber to suck the web into contact with the edges of said opening and said portion of the surface of the roller; means for supplying coating liquid into the chamber to wet the surface of the roller; and means for rotating the roller to convey coating liquid to the web, said means for rotating the roller being arranged to move the roller surface adjacent the web in the same direction as the motion of the web and at a speed which is up to that of



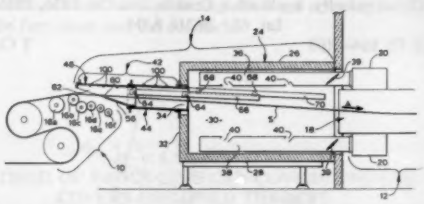
the web, the vacuum in that portion of said chamber between the roller and the edge of the chamber downstream from the roller cooperating with the external atmospheric pressure to prevent substantial penetration of said liquid into the body of the web beyond the coated surface.

4,136,636

SOLVENT VAPOR COLLECTOR

Kenneth Ellison, 20 Avondale Cres., Markham, and Alan S. Whike, R.R. #1, Caledon East, both of Canada, assignors to B & K Machinery International Ltd., Toronto, Canada

Filed Sep. 26, 1977, Ser. No. 836,522
Int. Cl.² B05C 15/00
U.S. Cl. 118—68 **14 Claims**



1. A solvent vapour collector for use on the upstream end of a strip sheet coating-curing oven, said oven receiving strip sheet material carrying a coating containing vapourizable solvents, said coating being applied at a coating station located upstream of said oven, said solvent vapour collector comprising;
a housing having a base, a roof, side walls and an upstream end wall and adapted about its downstream end to be secured to an upstream inlet end of such a curing oven;
an elongated shroud movably mounted in said upstream end wall of said housing for movement between a retracted position in which said shroud is disposed at least partially within said housing and an extended position in which said shroud projects in an upstream direction from said housing towards said coating station, said shroud being defined by at least a roof and side walls and having an opening for the passage into said shroud of both solvent vapours and a coated strip sheet for passage to such an oven, said opening being open to atmosphere at all times;
co-operating guide means on said housing and said shroud permitting movement of said shroud between said retracted and extended positions thereof;
air induction means in said housing for inducting ambient air through said opening and said shroud into said oven, thereby entraining solvent vapours therewith, and,
shroud heating means along the roof of said shroud for

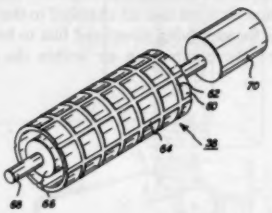
heating same thereby preventing condensation of solvent vapours thereon.

4,136,637

CONTINUOUS CONTRAST DEVELOPMENT SYSTEM

Christopher Snelling, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 9, 1977, Ser. No. 776,015
Int. Cl.² G03G 15/09
U.S. Cl. 118—658 6 Claims



1. A development apparatus, including:

a housing defining a chamber for storing a supply of developer material therein; and

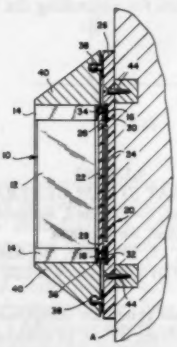
a donor member disposed in the chamber of said housing for advancing the developer material into the development zone, said donor member comprising a magnetic member, and a tubular member interfit telescopically over said magnetic member, said tubular member having at least two sets of plurality of grooves, one set of said plurality of grooves extending about the circumferential surface of said tubular member and being substantially equally spaced from one another in a direction extending along the longitudinal axis of said tubular member and the other set of said plurality of grooves extending substantially parallel to the longitudinal axis of said tubular member and being substantially equally spaced from one another about the circumferential surface of said tubular member.

4,136,638

MOUNTING FOR WALL AQUARIUM

Joseph J. Fedor, 7 Tulip Ave., Budd Lake, N.J. 07828

Filed Feb. 17, 1977, Ser. No. 769,456
Int. Cl.² A01K 64/00
U.S. Cl. 119—5 5 Claims



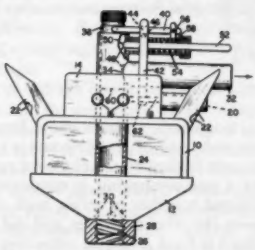
1. An improved decorative wall mounting for an aquarium of the type including an aqua tank of transparent material having at least a planar substantially rectilinear rear panel and an open mouth portion adjacent thereto, comprising a reinforced edging along opposite laterally extending edges of said rear panel, first and second corresponding channel members secured respectively to said reinforced edging, said first channel member disposed parallel to and adjacent with said open mouth portion, a frame including a prominent inner border complementary to said rear panel, said inner border determining an interior picture slot, and an outer border recessed relative to said inner border adapted to supplementarily overfit said rear panel, first and second laterally extending channels being determined between said inner and outer borders, said first and second channel members being adapted to overfit opposite edges of said inner border and respectively register in said first and second channels, snap means mounted on said outer border of said frame, a cover member overfittable onto said tank and releasably receivable into said snap means, means to cover said open mouth portion with said cover member when said cover member engages said snap means, means to slide a picture into and out of said picture slot whilst said cover member engages said snap means, and means for mounting said frame on a vertical standard, whereby said open mouth portion is opened for access when said cover member is disengaged from said snap means.

4,136,639

VACUUM AND PULSATOR AUTOMATIC SHUTOFF FOR A CLAW

Daniel O. Noorlander, Orem, Utah, assignor to I.B.A. Inc., Millbury, Mass.

Filed Apr. 15, 1977, Ser. No. 787,862
Int. Cl.² A01J 5/04
U.S. Cl. 119—14.55 10 Claims



1. A milking machine claw comprising a milk tank, vacuum means connected to the interior portion of said tank for drawing off the milk, a plug having a position closing said vacuum means and a position opening the same, movable means temporarily holding said plug in vacuum clear condition but upon being retracted allowing the plug to move to its position closing off the vacuum to the milk tank,

pulsator passage means, and means for opening and closing these passage means with the motion of the plug.

4,136,640

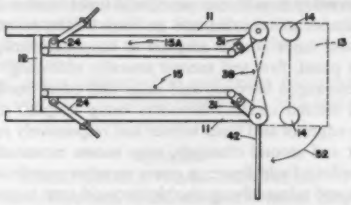
CATTLE SQUEEZE GATE

Armand Gofflot, R.R. #1, Pipestone, Canada (R0M 1T0)

Filed Mar. 7, 1977, Ser. No. 774,803
Claims priority, application Canada, Apr. 15, 1976, 250383
Int. Cl.² A61D 3/00
U.S. Cl. 119—99 12 Claims

1. A squeeze gate assembly in conjunction with a head gate assembly, said squeeze gate assembly comprising in combination a base frame, a pair of substantially parallel side gate components, front and rear linkage means mounting said components to said base frame for swinging action inwardly and outwardly relative to one another, actuating means for moving said components towards and away from one another, end lock means co-operating between said actuating means and said

components for selectively locking said components in the desired position relative to one another, said rear link means



being detachable whereby said components can swing freely outwardly from said base upon said front linkage means.

4,136,641

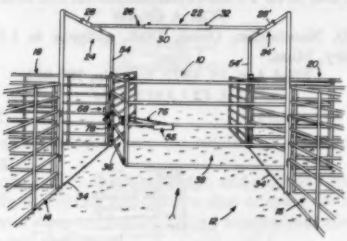
LIVESTOCK SORTING GATE

Herbert F. Hoffman, Platte, S. Dak. 57369

Filed Mar. 21, 1977, Ser. No. 779,738

Int. Cl.[2] A01K *29/00*; E01F *13/00*

U.S. Cl. 119—155 **9 Claims**



7. For use in conjunction with a chute forming a path for guiding animals, and a pair of pens disposed in opposed relation laterally of the path formed by the chute for receiving animals from the chute, a gate comprising, in combination, three sides pivotally connected together in series, with one of the sides disposed between the other two sides, and the other two sides pivotally mounted at fixed pivots on respective lateral edges of the chute, the fixed pivots of the other two sides being points on a line of a fourth side of the gate, such that the gate is in the form of a four-bar linkage swingable transversely of the path formed by the chute, and motor means attached to the gate for controlling movement of the gate.

4,136,642

METHOD OF AND APPARATUS FOR REGULATING STEAM AND HOT WATER BOILERS EMPLOYING FLUIDIZED FUEL

Pavel Novotny, and Ludvik Fiala, both of Prague, Czechoslovakia, assignors to CKD DUKLA, narodni podnik, Prague, Czechoslovakia

Filed Oct. 12, 1977, Ser. No. 841,602

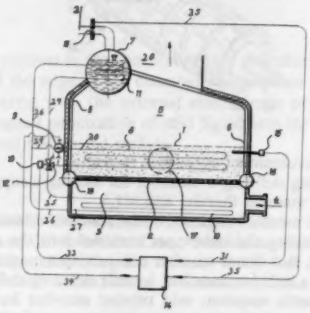
Claims priority, application Czechoslovakia, Oct. 13, 1976, 6605/76

Int. Cl.[2] F22B *1/02*; F23D *19/02*

U.S. Cl. 122—4 D **5 Claims**

1. A method of regulating the heating power of a stream or hot water boiler burning powdered fuel maintained in suspension by fluidizing air introduced into the combustion chamber of the boiler in dependence on the temperature of the burning fluidized fuel layer and on the heat output of the boiler, the boilers being provided with heat-transmitting means adapted for the passage of a heat-transmitting medium, the heat-transmitting medium having a part disposed in the burning fluidized fuel layer, the method comprising: upon a reduction in the temperature of the burning fluidized fuel layer increasing the rate of transmission of heat by the heat-transmitting medium to the fluidizing air, and upon a rise in the temperature of the burning fluidized fuel layer decreasing the rate of transmission of heat by the heat-transmitting medium to the fluidizing air.

4. Apparatus for regulating the heating power of a steam or hot water boiler having a boiler drum and burning powdered fuel maintained in suspension by fluidizing air introduced into the combustion chamber of the boiler in dependence on the temperature of the burning fluidized fuel layer and on the heat output of the boiler, comprising a boiler drum, a combustion chamber for a fluidized particulate fuel, an air chamber for fluidizing air below the combustion chamber, means for supplying combustion air from said air chamber to the combustion chamber, means for supplying powdered fuel to be maintained in suspension by the combustion air within the combustion



chamber, heat-transmitting means for the passage of a heat-transmitting medium for the regulation of the output of heat by the boiler, a heat-transmitting system containing said heat-transmitting medium, the system having a first part disposed within the burning fluidized fuel layer in the combustion layer, a second part disposed in the boiler drum of the boiler, and a third part disposed in the air chamber of the boiler, valve means adapted to control the flow of the heat-transmitting medium between said parts of the heat-transmitting system, a temperature feeler in the burning fluidized fuel layer in the combustion chamber of the boiler, a device for measuring the heat output of the boiler drum, means for evaluating values measured by said temperature feeler and said device for measuring the heat output of the boiler drum, and means controlled by said evaluation means for controlling the valve.

4,136,643

WASTE HEAT STEAM GENERATOR

Emile Aguet, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 15, 1977, Ser. No. 824,693

Int. Cl.[2] F22B *1/18, 31/04*; F22G *5/06*

U.S. Cl. 122—7 B **12 Claims**

1. A waste heat steam generator comprising

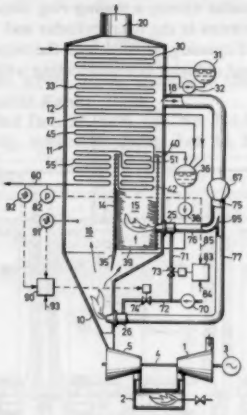
an entrance for receiving a flow of exhaust gas;

a pair of channels disposed in parallel relation relative to a flow of exhaust gas downstream of said entrance;

at least one heating surface in each said channel for conveying a working medium therein in heat exchange relation with a flow of exhaust gas in said respective channel;

a first supplemental burner disposed in one of said channels to heat a flow of exhaust gas therein to a temperature above 900° C.; and

a second supplemental burner disposed between said entrance and said heating surface in said other of said chan-



nels to heat a flow of exhaust gas therein to a temperature less than 900° C.

4,136,644

TUBE HEAT EXCHANGER WITH HEATING TUBES

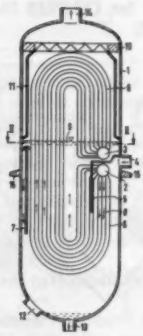
Herbert Tratz, Ottensoos; Richard Welch, and Jürgen Hoffmann, both of Erlangen, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mülheim, Germany

Filed Dec. 20, 1976, Ser. No. 752,093

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558127

Int. Cl.[2] F22B *1/02, 37/54*

U.S. Cl. 122—32 **5 Claims**



1. In a tube heat exchanger having a substantially cylindrical housing, a pair of adjacent cylindrical headers disposed in the housing, and a multiplicity of downwardly extending U-shaped heat exchanger tubes connecting the headers to one another, one of the headers being an inlet header and the other thereof being an outlet header, both of said headers being connectible to pressurized water lines of a pressurized water nuclear reactor, a feedwater supply connected to the housing below the outlet header for supplying a quantity of feedwater into the housing up to a given level partly filling the housing during operation of the heat exchanger, the heat exchanger tubes extending upwardly from said outlet header above said given feedwater level and being formed with a U-shaped bend located above said given level, and a flow guide plate disposed in said housing and connected to the inner wall surface thereof above said feedwater supply and, inclusive of a part of said heat exchanger tubes, extending in a downward direction.

4,136,645

ELECTRIC AIR-TO-FUEL RATIO CONTROL SYSTEM

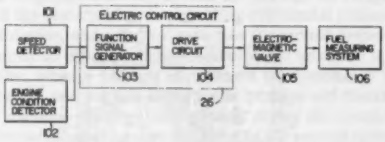
Osamu Ito, Toyota; Nobuhito Hobo, Inuyama; Yutaka Suzuki, Nishio; Itsushi Kawamoto, Ohiryu; Takashi Naitou, Kariya; Makoto Shiozaki, Toyota, and Yoshimune Konishi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed May 11, 1977, Ser. No. 795,910

Claims priority, application Japan, Jun. 15, 1976, 51-70847

Int. Cl.[2] F02B *3/08;* **F02M** *7/12;* **F01N** *3/08*

U.S. Cl. 123—32 EE **9 Claims**



1. An air-to-fuel ratio control system for internal combustion engines comprising:

a carburetor, provided in the intake passage of an engine of a vehicle, for supplying said engine with air-fuel mixture, said carburetor including a float chamber in which fuel is stored, a venturi at which said fuel is mixed with air, and a fuel passage which communicates said float chamber with said venturi;

a speed detector for generating a first signal indicative of the vehicle speed;

an air-to-fuel ratio detector, provided in the exhaust passage of said engine, for generating a second signal related to the air-to-fuel ratio of said mixture supplied to said engine;

a pressure detector, provided in said intake passage, for generating a third signal indicative of the pressure in said intake passage;

a frequency-to-voltage converter circuit connected to said speed detector, for generating a fifth voltage signal whose voltage corresponds to the frequency of said first signal;

a first vehicle-speed function voltage generator connected to said frequency-to-voltage converter circuit, for generating a sixth voltage signal related to the comparison of said fifth voltage signal to a first predetermined level;

a second vehicle-speed function voltage generator connected to said frequency-to-voltage converter circuit, for generating a seventh voltage signal related to the comparison of said fifth voltage signal to a second predetermined level;

a first logical circuit connected to said first vehicle-speed function voltage generator and said pressure detector, for generating a first logical output signal from said second sixth signal and said third signal;

a second logical circuit connected to said second vehicle-speed function voltage generator and said pressure detector, for generating a second logical output signal from said seventh voltage signal and said third signal;

a third logical circuit connected to said first logical circuit and said air-to-fuel ratio detector, for generating a third logical output signal from said first logical output signal and said second signal; and

a fourth logical circuit connected to said second and third logical circuits, for generating a fourth signal by logical operation on said second and third logical output signals so that said fourth signal corresponds to said second signal when the speed of said vehicle is less than a first predetermined value, to one of said second and third signals when the speed of said vehicle is between said first value and a second predetermined value greater than said first value and to said third signal when the speed of said vehicle is greater than said second value; and

electromagnetic valve means, connected to said function signal generator and provided in said fuel passage, for controlling the amount of fuel flowing therethrough in response to said fourth signal, whereby the air-to-fuel

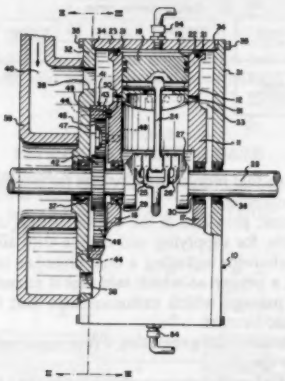
ratio of said mixture is switched in response to said speed of said vehicle.

4,136,646

TWO CYCLE ROTARY INTERNAL COMBUSTION ENGINE

Cleto L. Lappa, 541 Torwood La., Pittsburgh, Pa. 15236

Filed Sep. 30, 1977, Ser. No. 838,383
Int. Cl.[2] F02B 57/06
U.S. Cl. 123—44 C **5 Claims**



1. In a two-cycle internal combustion engine having a rotary cylinder block comprising a plurality of radially arranged angularly spaced cylinders supported at their outer extremities by an annular rim member, each cylinder having a bore open at its outer end and having a piston reciprocable therein, said pistons being connected to a common crank arm of a crankshaft, a circular housing within which said rotary cylinder block rotates, said housing having a series of exhaust ports and fuel injectors arranged circumferentially in angularly spaced relation with which said open-ended bores sequentially register, means providing a sealed contact between each cylinder and said circular housing, said cylinders having air admission ports in the side walls thereof located so as to be covered and uncovered by movement of the pistons in the bores of said cylinder, the improvement comprising end covers closing the open ends of said circular housing, one of said end covers having perforations therein, and an intake manifold secured thereto in sealed relation such that air under pressure supplied to said manifold flows through said perforations to the interior of said circular housing whence it flows in surrounding relation to said cylinders, for cooling the cylinders and preheating the air under pressure, and via said air admission ports into the bores of said cylinders, from which it is exhausted via the said exhaust ports.

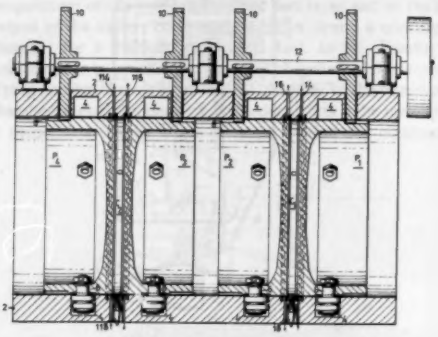
4,136,647

ROTARY DEVICE PARTICULARLY USEFUL AS A ROTARY ENGINE

Moshe Stoler, 10 Tirosh St., Ramat Hasharon, Israel

Filed Apr. 27, 1977, Ser. No. 791,326
Int. Cl.[2] F02B 75/28
U.S. Cl. 123—45 R **3 Claims**

1. A rotary engine, comprising: a fixed cylinder; a least one pair of pistons displaceable in the cylinder towards and away from each other to define an expansible and contractable chamber therebetween; a first annular recess formed in said fixed cylinder on one side of the expansible and contractable chamber; a first annular array of fuel intake openings formed through said fixed cylinder and communicating with said first annular recess; means for igniting the fuel inletted through said fuel intake openings; a second annular recess formed in said fixed cylinder on the opposite side of said expansible and contractable chamber; a second annular array of exhaust openings formed through said fixed cylinder and communicating with said second annular recess; a sealing ring disposed in each of said annular recesses in the fixed cylinder and formed with an annular array of openings aligned with the respective openings through the fixed cylinder communicating with the respective



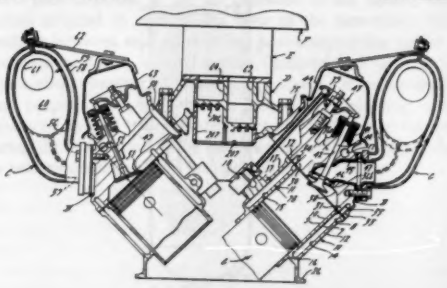
annular recess; the inner surface of said cylinder being formed with cam slots, and the outer surface of said pistons including cooperable cam follower means such that the displacement of said pistons axially towards and away from each other effects a rotation of said pistons with respect to said cylinder; and a rotary output drive shaft coupled to said rotating pistons.

4,136,648

LOW WEIGHT RECIPROCATING ENGINE

Robert P. Ernest, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 22, 1976, Ser. No. 753,347
Int. Cl.[2] F02B 75/22
U.S. Cl. 123—55 VE **14 Claims**



1. In an engine housing for a reciprocating engine, effective to receive operating pistons, the apparatus comprising:

(a) a one piece integrally cast block having first wall portions defining at least one series of uniformly thin-walled barrels, each barrel being integrally tangentially connected in consecutive order to the next adjacent barrel, said first wall portions presenting a continuous undulating outwardly facing side surface, said block having second wall portions surrounding said first wall portions and defining a series of overlapping integral thin walled barrel sections interrupted at the area of overlap in a manner so that the interior surfaces of said second wall portions form an opposing surface complimentary to that of the outwardly facing surface of said first wall portions but uniformly spaced therefrom, said block having third wall portions commonly joining said first and second wall portions to form a closure at the bottom end of said spacing, and

(b) means effective to statically place at least said first walls

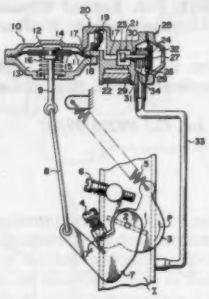
in high compression for and during normal engine operation.

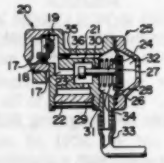
4,136,649

DASHPOT

Akira Takahashi, Kyoto, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Dec. 27, 1976, Ser. No. 754,526
Claims priority, application Japan, Jan. 16, 1976, 51-4524
Int. Cl.[2] F02D *11/08*
U.S. Cl. 123—103 R **5 Claims**





1. A dashpot unit for preventing sudden closing of a carburetor throttle valve of an internal combustion engine, comprising;

a lever and a shaft secured thereto for setting a throttle valve of an engine, the lever having a return spring for urging the lever, and thereby the shaft, to close the valve, the lever also having a stop disposed so that the lever contacts it when the valve provides a predetermined degree of opening, during a motion of the valve to close in an idling condition of the engine;

a delay member secured to the shaft for slowing the closing of the valve;

a first pressure differential responsive device having a first pressure differential responsive member linked to the delay member, the device comprising a housing with two chambers separated by the responsive member, and a spring for urging that member to move the delay member linked to it to open the valve and for thereby increasing the size of one of the two chambers, to slow the motion of the valve, while the size of the other chamber is correspondingly decreased, the one chamber having a vent;

means defining an air passage opening to the atmosphere to vent also the other chamber;

a vent delay device contained in the air passage and having means defining an orifice, the passage also having, in parallel with the orifice, a non-return valve for permitting only passage of air from the other chamber to the atmosphere through the latter valve;

a delay control valve interposed on the air passage in series with and closer to the atmosphere than the delay device, for opening and closing the passage containing the delay device; and

a second pressure differential responsive device for actuating the delay control valve, comprising a second pressure differential responsive member linked to the delay control valve, means defining a vacuum chamber on one side of the latter member and a chamber vented to the atmosphere on the other side thereof, a vacuum tube connecting the vacuum chamber with a portion of an engine intake passage downstream of the throttle valve to cooperate with the vented chamber in providing a differential pressure in the second responsive device, the vacuum chamber being connected with the other chamber of the first responsive device by the air passage to cooperate with the one chamber in providing differential pressure in that device, and a second spring in the second responsive member to open the delay control valve linked to it;

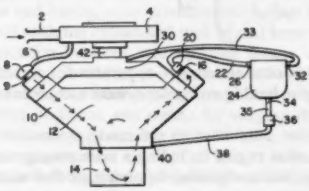
whereby, when a vacuum exceeding a predetermined level occurs in said portion of the intake passage and thereby in the vacuum chamber, the vacuum draws the second responsive member against the force of the second spring to close the delay control valve and thus the air passage, thereby enabling the first pressure differential responsive device to position the throttle valve in a high engine speed area, and also to function as a dashpot in a low engine speed area, thus minimizing emission of unburned exhaust gas from the engine regardless of whether the engine operates in the high or low engine speed area.

4,136,650

CRANKCASE OIL VAPOR RECOVERY SYSTEM

Arman Manookian, Jr., 2875 Terrell Ave., Oceanside, N.Y. 11572

Filed Mar. 2, 1977, Ser. No. 773,617
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 B **4 Claims**



1. In a combustion-type engine through which lubricating oil flows and having an oil sump,

a source of input air directed to the interior of the engine whereat the air becomes mixed with oil,

a source of vacuum, by which said input air introduced into the engine is directed to the interior thereof for mixture with the lubricating oil,

an air exhaust means communicating with the interior of said engine,

conduit means connecting said air exhaust means with said source of vacuum,

means in series connection with said conduit for filtering the oil-mixed air to separate from the air oil mixed therewith,

means to collect the filtered oil,

said filter means comprising a bounded chamber defining a flow passage and having defined therein an inlet aperture connected by said conduit means to said air exhaust means and an outlet aperture connected by said conduit means to the source of vacuum at opposite ends of said flow passage, a drainage port for enabling removal from said bounded chamber of at least some of the oil separated from the oil-mixed air, and a filtering material located in the flow passage between the inlet and outlet apertures such that air entering said bounded chamber at the inlet aperture must pass through said filtering material to exit said bounded chamber through the outlet aperture, said filtering material being favorably-permeable to air but offering resistance to the through-flow of oil,

and valve means in series connection with said drainage port to close the same against through-flow of oil during periods of engine operation, said collecting means being in series connection with said drainage port and valve means to collect the filtered oil passing in series through said drainage port and valve means.

4,136,651

ADDITIONAL AIR CONTROL APPARATUS

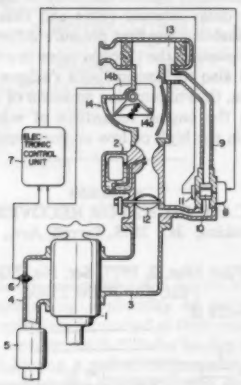
Tadashi Hattori, Okazaki; Takamichi Nakase, Gamagori, and Hiroaki Yamaguchi, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Oct. 5, 1976, Ser. No. 729,871

Claims priority, application Japan, Oct. 16, 1975, 50-125133

Int. Cl.[2] **F02M** *7/00, 13/04;* **F02B** *75/10;* **F02M** *3/00*

U.S. Cl. 123—119 EC **9 Claims**



1. An additional air control apparatus for an internal combustion engine having an intake system and an exhaust system comprising:

a carburetor connected to the intake system of an internal combustion engine including a main passage and a bypass passage, said carburetor supplying air-fuel mixture to said engine;

said main passage being provided with a throttle valve for controlling an amount of air-flow and said bypass passage being provided with a control valve for compensating the air-fuel ratio of said air-fuel mixture by controlling an amount of additional air-flow flowing therethrough;

gas sensing means mounted in the exhaust system of said engine for sensing the oxygen content of the exhaust gases and deriving an electrical sensing signal;

electronic control means electrically connected to said gas sensing means for producing an intermittent output signal in accordance with said sensing signal,

said control means including,

an A/F discrimination circuit for comparing said sensing signal with a preset value and for generating a comparison signal in accordance with a result of the comparison,

an oscillation circuit for generating a first and a second pulse signal of different frequencies,

a command circuit electrically connected to said A/F discrimination circuit and said oscillation circuit for generating a forward or a reverse signal in accordance with said comparison signal of said A/F discrimination circuit, said command circuit being also adapted to combine said first and second pulse signals and to permit said first pulse signal to pass only during a time period determined by said second signal thereby to form said forward signal or said reverse signal occuring intermittently,

a reversible shift register electrically connected to said command circuit for generating a forward shift and a reverse shift signal by shifting outputs sequentially in response to said forward and reverse signals, and

a switching circuit electrically connected to said reversible shift register for generating a switching signal in response to said forward and reverse shift signals; and

a pulse motor coupled to said control valve and electrically connected to said control means for alternately driving stopping said control valve in a skip movement fashion in response to said switching signal.

4,136,652

FUEL DELIVERY SYSTEM

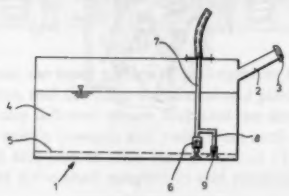
Wenpo Lee, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfburg, Fed. Rep. of Germany

Filed Oct. 19, 1976, Ser. No. 733,804

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1975, 2549104

Int. Cl.[2] **F02M** *59/00*

U.S. Cl. 123—136 **3 Claims**



1. A fuel delivery system for an internal combustion engine operated with a gasoline/alcohol fuel mixture, said system comprising:

(a) a fuel tank;

(b) a fuel pressure line for delivering fuel from said tank to said engine;

(c) a fuel pump, disposed within said fuel tank and so situated that it is immersed when fuel is present in the tank, said fuel pump having a fuel suction line with an inlet opening near the bottom of said tank for drawing fuel from the tank, said fuel pump being connected to said fuel pressure line for supplying fuel thereto under pressure, and said fuel pump having a capacity in excess of that required for running said engine; and

(d) a fuel return line connected to said fuel pressure line at a point within said fuel tank for returning fuel directly to said fuel tank, said return line having an outlet opening arranged near said inlet opening at the bottom of said tank and directed towards the bottom of said tank.

4,136,653

PRESSURE CONTROL VALVE ASSEMBLY

Heinrich Knapp, Leonberg; Reinhardt Schwartz, Stuttgart-Sillenbuch; Walter Schlott, Rommelshausen; Klaus Riel, Möglingen, and Klaus-Jürgen Peters, Affalterbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 19, 1977, Ser. No. 798,521

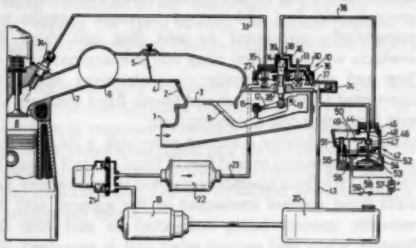
Claims priority, application Fed. Rep. of Germany, May 22, 1976, 2623121

Int. Cl.[2] **F02M** *39/02, 1/10*

U.S. Cl. 123—139 AW **3 Claims**

1. A pressure control valve assembly for controlling the pressure of a fluid which provides a restoring force on the fuel control plunger of a fuel injection system associated with an internal combustion engine, said pressure control valve assembly including: a spring loaded diaphragm valve for providing selective return flow of said fluid to a storage tank, an ambient air pressure responsive cell for exerting an ambient air pressure-dependent force on said diaphragm to thereby urge said

diaphragm valve to close and alter the pressure of said fluid in dependence on ambient air pressure; and a first temperature-responsive element for exerting a first temperature-dependent mechanical force on said diaphragm at temperatures below a first predetermined temperature to oppose the force exerted by said pressure cell and said spring to thereby alter the pressure of said fluid in temperature-dependent manner, the improvement in said pressure control valve assembly comprising:



a second temperature-responsive element for exerting a second temperature-dependent mechanical force on said diaphragm to further oppose the force exerted by said pressure cell on said diaphragm at temperatures below a second predetermined temperature lower than said first predetermined temperature.

4,136,654

FUEL INJECTION NOZZLE FOR PRELIMINARY AND MAIN INJECTION INTO INTERNAL COMBUSTION ENGINES

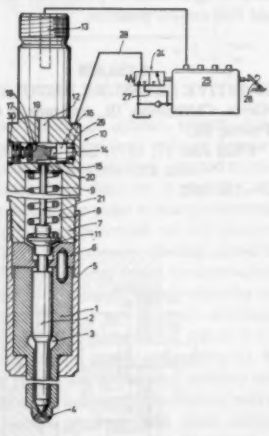
Günter Kulke, Esslingen; Odon Kopse, and Gregor Schuster, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,290

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1975, 2558766

Int. Cl.[2] F02M *39/00*

U.S. Cl. 123—139 AT **12 Claims**



1. A fuel injection nozzle for internal combustion engines provided with a needle valve which is shiftable under pressure of the fuel supply against the force of a closing spring, the opening stroke of said needle valve being changeable by a movable slide which serves to limit the stroke of the needle valve, the improvement comprising said slide being disposed substantially transversely in relation to the symmetry axis of the needle valve and including a body portion having spaced end walls and a medial portion having a circular cross-sectional shape of varying diameter arranged to cooperate with the needle valve to limit the axial movement thereof and means responsive to the fuel pressure in the internal combustion engine for adjusting the position of said slide.

4,136,655

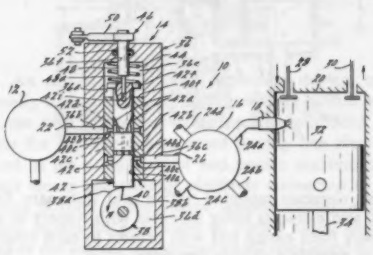
FUEL METERING VALVE WITH INLET METERING CONTROL

Werner G. Mannhardt, Detroit, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jun. 29, 1977, Ser. No. 811,002

Int. Cl.[2] F02M *41/00*; F16K *31/44*

U.S. Cl. 123—139 AP **28 Claims**



1. In a fluid metering valve including a valve housing having a cylindrical bore and fluid inlet and outlet opening means communicating with said bore, a valving member axially moveable a given distance in said bore between first and second positions and having a circumferential surface in sliding-sealing contact with the cylindrical wall of said bore for blocking communication between said opening means when said valving member is in said first and second positions, means for moving said valving member axially in said bore between said first and second positions, and means for varying the angular position of said valving member in said bore, wherein the improvement comprises:

metering means defined by said valving member and operative in response to axial movement of said valving member from said second position to said first position to intercommunicate said inlet and outlet opening means for a portion of said given distance and define a continuous passage through said valve housing, said metering means operative in response to variations in the angular position of said valving member in said bore to vary said portion of said given distance that defines said continuous passage through said valve housing for controlling the amount of fluid metered to said outlet opening means independent of the axial velocity of said valving member.

4,136,656

LOAD CONTROL DEVICE FOR TURBO-SUSPERCHARGED DIESEL ENGINES

Sergei S. Sokolov; Viktor K. Safonov, and Leonid I. Vlasov, all of Leningrad, U.S.S.R., assignors to Tsentralny Nauchno-Issledovatelsky Dizelny Institut, U.S.S.R.

Filed Jul. 26, 1977, Ser. No. 819,106

Int. Cl.[2] F02D *1/04, 1/06*

U.S. Cl. 123—140 FG **1 Claim**

1. A load control device for turbo-supercharged diesel engines, comprising:

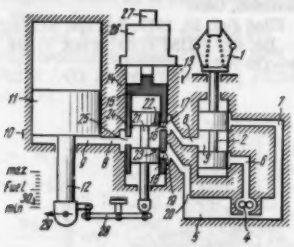
a diesel engine crankshaft speed measuring mechanism;

a pilot valve connected to said diesel engine crankshaft measuring mechanism;

a sump containing hydraulic fluid;

a pump located within said sump for delivering hydraulic fluid into said pilot valve;

a first passage hydraulically connecting said pilot valve to said sump;
a servomotor having a tailrod and means hydraulically connecting the servomotor to said pilot valve;
a second passage hydraulically connecting said pilot valve to said servomotor;
a stroke limiter of said tailrod of said servomotor, located within said second passage;
a stationary fixed casing of said tailrod stroke limiter having ports therein communicating with said second passage;



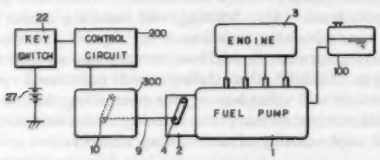
two valve elements mounted within said stationary fixed casing, said elements being movable with respect to said stationary fixed casing and with respect to each other in order to provide a valving function;
means connecting one of said elements to said tailrod of said servomotor;
a third passage hydraulically connecting said tailrod stroke limiter to said sump; and
a pressure sensor, charging air pressure being supplied thereto, means connecting said pressure sensor to said second element of said tailrod stroke limiter.

4,136,657

ELECTRIC CONTROL SYSTEM FOR DIESEL ENGINE

Keigo Tanaka, Anjo, and Yoshiyuki Morita, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 18, 1977, Ser. No. 843,507
Claims priority, application Japan, Oct. 21, 1976, 51/142085[U]
Int. Cl.[2] F02M *39/00*
U.S. Cl. 123—140 R **2 Claims**



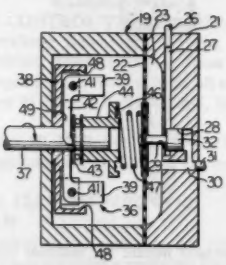
1. An electric control system for a diesel engine comprising:
a fuel injection pump for supplying fuel to a diesel engine:
a governor coupled to said fuel injection pump for controlling the amount of fuel to be supplied to said engine in response to operational conditions of said engine, said governor being provided with a control lever having a fuel cut-off position, a normal operation position and a starting position:
a battery:
a key switch having an Off position contact, an operating position contact, a start position contact and a movable contact connected to said battery:
an actuator having a reversible electric motor operatively connected to said control lever of said governor for driving the same, and a cam switch operatively connected to said electric motor, said electric motor having a pair of brushes: and
an electric control circuit for controlling the operation of said electric motor in accordance with the turning of said key switch,
said electric control circuit including;
a first relay having a first relay coil connected to said start position contact of said key switch, first and second movable contacts respectively connected to said brushes of said electric motor, and first to fourth fixed contacts, said first fixed contact being connected to said battery, said second and third fixed contacts being connected to the ground, said first and second movable contacts being respectively connected to said first and third fixed contacts when said first relay coil is energized while said first and second movable contacts being respectively connected to said second and fourth fixed contacts when said first relay coil is deenergized;
a second relay having a second relay coil, a third movable contact connected to said fourth fixed contact of said first relay, a fifth fixed contact connected to said battery, and a sixth fixed contact connected to the ground, said third movable contact being connected to said fifth fixed contact when said second relay coil is energized while being connected to said sixth fixed contact when said second relay coil is deenergized; and
a third relay having a third relay coil connected to said operating position contact of said key switch, a fourth movable contact connected to said battery, and a seventh fixed contact, said movable contact being connected to said seventh fixed contact when said third coil is deenergized;
said cam switch having a movable conductive metal plate rotatable with said control lever, and first, second and third sliding contacts, said first sliding contact being connected to said battery and being contacted with said metal plate when said control lever is moved from said starting position to said normal operation position, said second sliding contact being connected to said seventh fixed contact of said third relay and being contacted with said metal plate when said control lever is positioned at a place other than said fuel cut-off position, said third sliding contact being connected to said second relay coil of said second relay and being contacted with said metal plate when said control lever is positioned at a position other than said fuel cut-off position.

4,136,658

SPEED SENSITIVE PRESSURE REGULATOR SYSTEM

Marvin A. Gates, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 17, 1977, Ser. No. 760,062
Int. Cl.[2] F02D *1/04*
U.S. Cl. 123—140 MC **5 Claims**



1. A speed sensitive pressure regulator system comprising:
a housing;
a diaphragm being of resilient flexible material and positioned within the housing and forming an actuating chamber;

passage means for introducing pressurized fluid into the chamber at a preselected pressure;

a valve associated with the passage means and being movable between a first position at which the fluid pressure in the actuating chamber is substantially equal to the fluid pressure in the passage means, and a second position at which the fluid pressure in the actuating chamber is less than the fluid pressure in the passage means, said valve being connected to the diaphragm in a manner sufficient for biasing the valve toward the second position in response to pressurized fluid in contact with the diaphragm; and

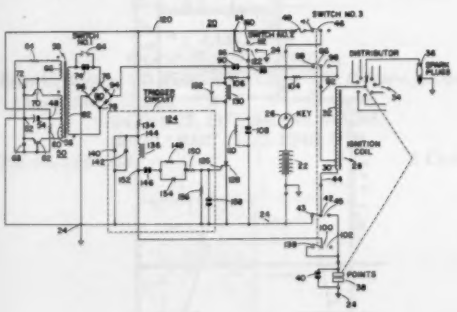
a flyweight assembly associated with the valve and being of a construction sufficient for moving the valve to its first position in response to rotation of the flyweight assembly above a preselected speed and for permitting the valve to move to the second position in response to a decrease in the rotational speed of the flyweight assembly below the preselected speed.

4,136,659

CAPACITOR DISCHARGE IGNITION SYSTEM

Harold J. Smith, 4642 Hanna St., Fort Wayne, Ind. 46806

Filed Nov. 7, 1975, Ser. No. 629,996
Int. Cl.[2] F02P *3/08*
U.S. Cl. 123—148 E **14 Claims**



1. In a capacitor discharge ignition system comprising an ignition transformer having a low voltage primary winding and a high voltage secondary winding adapted to be coupled in sequence at predetermined times to a plurality of spark devices, means for generating a pulse at said predetermined times, a source of direct current potential, an AC power capacitor coupled in series with said primary winding across said source and being charged thereby, gate means for short-circuiting said source in response to a control signal whereby said power capacitor discharges through said primary winding, and control means for providing a said control signal in response to each said pulse; the improvement comprising an AC ringing capacitor directly connected across said primary winding and proportioned to provide a damped oscillatory current therein when said gate means removes said short circuit thereby clamping the peak induced voltage in said secondary winding to a low predetermined value to inhibit misfiring;

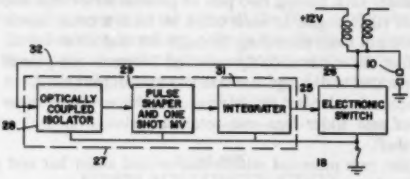
said direct current source including a DC to AC inverter having an output circuit, and a full-wave rectifier coupled to said output circuit, and further comprising another AC capacitor smaller than said power capacitor series-connected with said rectifier in said output circuit for inhibiting stopping of the oscillation of said inverter by said gate means being turned ON.

4,136,660

OIL PRESSURE FAILURE PROTECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

Howard J. Palmer, 68 Gaywood Pl., Moraga, Calif. 94556, and James R. Bechard, 170 Perkins St., Oakland, Calif. 94610

Filed Nov. 14, 1977, Ser. No. 851,046
Int. Cl.[2] F02B *77/08*
U.S. Cl. 123—198 DC **8 Claims**



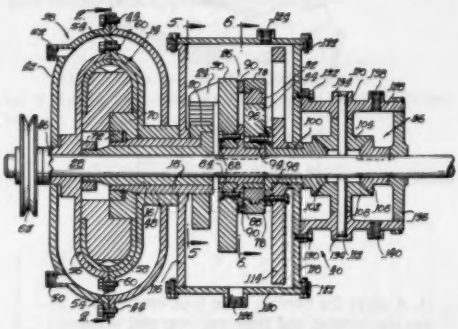
1. An engine malfunction protection device, comprising normally open engine malfunction sensing switch means having one pole connected to ground; a controlled switching means for limiting engine speed having one electrode connected to the other pole of said engine malfunction sensing switch means and another electrode connected to the spark forming portion of the engine ignition circuit; engine speed sensing means for generating an output signal analog of the speed of the engine, said output signal connected to the actuator of said controlled switching means, said actuator having a predetermined triggering threshold; and electrical power supply means, said engine speed sensing means being normally unpowered and connected directly to one side of said power supply means and connected through said engine malfunction sensing switch means to the other side of said power supply means.

4,136,661

ROTARY ENGINE

Chester A. Posson, 4651 Teonia Woods Rd., Rolling Meadows, Ill. 60008

Filed Feb. 25, 1977, Ser. No. 772,085
Int. Cl.[2] F02B *53/00*
U.S. Cl. 123—205 **4 Claims**



1. A rotary engine comprising:

a housing defining an internal annular chamber,

first and second concentric shafts extending through said housing and terminating at one end within said annular chamber,

a first pair of radially extending rotor blades centrally mounted within said annular chamber on said first concentric shaft, said rotor blades in substantially sealed engagement with the surface of said annular chamber,

a second pair of radially extending rotor blades centrally mounted within said annular chamber on said second

concentric shaft, said rotor blades in substantially sealed engagement with the surface of said annular chamber,

said first and second pair of rotor blades being alternately spaced to divide said annular chamber into four engine chambers,

a pinion gear segment fixed on the end of each concentric shaft exterior of said housing,

an output shaft carried adjacent said housing,

a slider rack having two pair of parallel slider legs disposed at right angles to each other to form a cross hatch, said output shaft extending through the said cross hatch,

a first slider bar slidably received between one pair of said parallel slider legs and fixed to said output shaft,

a second slider bar slidably received between the other pair of said slider legs and rotatable relative to said output shaft,

a disc cam mounted within said second slider bar and positively engaged therewith,

a return gear system engaging said output shaft and said cam to rotate said cam opposite the rotation of said output shaft, rotation of said slider rack serving to rotate said first and second slider bars and said output shaft in one direction and said cam in the opposite direction, the rotation of said cam causing said second slider bar and said slider rack to oscillate linearly as they rotate,

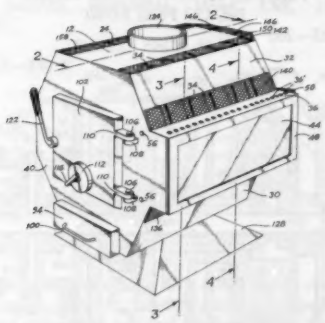
a pair of parallel facing gear racks mounted on said slider rack, each gear rack engaging one of said pinion gears whereby linear oscillation of the slider rack and the gear racks thereon will cause the pinion gear segments, concentric shafts and rotor blades to move through partial revolutions backwards and forwards, alternately expanding and contracting said engine chambers to provide selected expansion, compression, intake and exhaust cycles.

4,136,662

WOOD BURNING STOVE

Allan C. Willson, P.O. Box 65, Mill City, Oreg. 97360

Filed Sep. 26, 1977, Ser. No. 836,502
Int. Cl.[2] F24C 1/14
U.S. Cl. 126—61 **20 Claims**



1. A stove for burning solid fuel, comprising:

(a) top, bottom and front and rear end walls,

(b) inner and outer front and rear side walls extending between the top, bottom and front and rear end walls and forming front and rear side room air passageways which are open at their top and bottom ends for the passage of room air upwardly therethrough, and also forming between the inner and outer walls of one of said side walls a combustion air passageway which is separated laterally from an adjacent room air passageway, the combustion air passageway being closed at its bottom end,

(c) a fuel-supporting grate above the bottom wall,

(d) an air opening in the outer side wall associated with the combustion air passageway intermediate the upper and lower ends of said side wall for admitting air into the combustion air passageway,

(e) a pair of air openings in the inner side wall associated with the combustion air passageway one intermediate the upper and lower ends of said wall and the other adjacent the lower end thereof for admitting air from said combustion air passageway into the interior of the stove above and below the fuel-supporting grate,

(f) a baffle member within said combustion air passageway separating the intermediate openings in the inner and outer side walls from each other, the baffle member extending downwardly from said opening in the outer side wall and terminating above the opening adjacent the lower end of the inner side wall, and

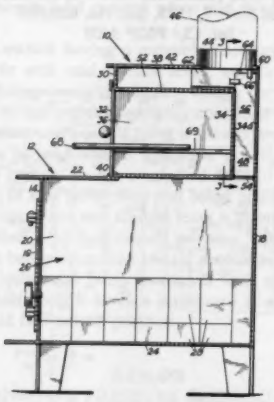
(g) a damper member in said combustion air passageway movable between positions varying the degree of admittance of air through the opening in the outer side wall to the space between the baffle member and the outer side wall.

4,136,663

HEATING UNIT

Derrell A. Gneiting, and John A. Gneiting, both of 856 E. Newport, Hermiston, Oreg. 97838

Filed Feb. 7, 1977, Ser. No. 766,044
Int. Cl.[2] F24C 1/14
U.S. Cl. 126—63 **9 Claims**



3. A heating unit comprising

(a) an outer shell including rear, side, top and bottom walls,

(b) an inner shell within said outer shell including rear, side, top and bottom walls,

(c) said inner shell being of less dimension than said outer shell at the top, sides and rear for forming a heat circulating area between said two shells at the top, sides and rear,

(d) a heat outlet at an upper portion of said outer shell whereby heat applied exteriorly to a lower portion of said heating unit flows up said circulating area and out said outlet,

(e) and a pair of baffles in the rear space between said inner and outer shells,

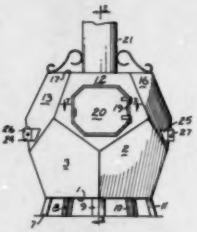
(f) said baffles extending from a lower portion of said inner shell to a point at an upper portion thereof adjacent to the top wall of said outer shell,

(g) said baffles having a narrow spacing therebetween at the bottom and diverging upwardly relative to each other with the tops thereof disposed on opposite sides of said heat outlet, whereby heat flowing up the sides adjacent the rear walls of said inner and outer shells flares outwardly as it flows up the baffles so as to be slowed and circulated forwardly in said heat circulating areas for efficiently heating the walls of said outer shell.

4,136,664
STOVE

Terrance R. Folsom, S. 4015 Conklin St., Greenacres, Wash. 99016

Filed Nov. 10, 1977, Ser. No. 850,420
Int. Cl.[2] F24C *15/08*
U.S. Cl. 126—64 5 Claims



1. A stove comprising a hollow body of pentagonal dodecahedron shape with a bottom wall and a top wall parallel to each other;

the two walls being joined by five upwardly diverging lower walls and five upwardly converging upper walls joined to each other to complete the hollow body;

one of the upper walls having a fuel inlet opening therein spaced below said top wall;

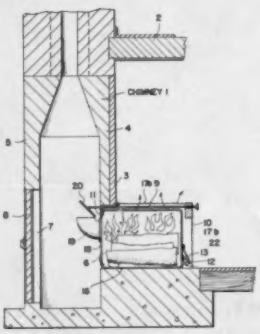
a door covering said fuel inlet opening;

the stove having an outlet for the gases produced at the point of the top wall most remote from the full inlet opening.

4,136,665
WOOD-BURNING STOVE

Peter U. Steffen, 159 Randlewood Close N.E., Calgary, Alberto, Canada (T1Y 2P2)

Filed Oct. 25, 1977, Ser. No. 845,265
Int. Cl.[2] F24C *15/30*; F24B *7/00*
U.S. Cl. 126—123 2 Claims



1. A wood-burning stove for installation at a chimney of a house, said chimney being adjacent a rock, brick, and the like, wall of the house and having first and second spaced opposite chimney walls, the first chimney wall abutting the wall of the house and the second chimney wall being outside and spaced from the house, the first chimney wall and the wall of the house having a first doorway formed therethrough and the second chimney wall having a second doorway formed therethrough, and a door thermally insulatedly movably mounted in the second doorway to provide access to the chimney, said wood-burning stove comprising

a substantially airtight combustion chamber in the house, said chamber having first and second spaced opposite ends, the first end having a draft hole formed therethrough and a draft door movably mounted thereon to selectively open the draft hole to a desired extent, the second end coinciding with the first doorway of the first chimney wall, sides and a top;

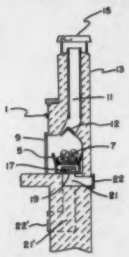
a stove door movably mounted in the second end of the chamber for supplying wood to the stove for combustion and for removing the products of combustion from the stove, said stove door having a smoke pipe extending therethrough into the chimney and a damper on the end of said smoke pipe; and

decorative screens at the top and the front of the chamber for permitting heat from a fire in the chamber to flow into the house therethrough to simultaneously warm rock, brick, and the like, walls at the sides of the stove and the rock, brick, or the like, wall of the house.

4,136,666
FIREPLACE CONSTRUCTION

Willard A. Haas, R.D. #2, Box 60B, Oley, Pa. 19547

Filed Mar. 2, 1977, Ser. No. 773,466
Int. Cl.[2] F24B *13/02*
U.S. Cl. 126—143 6 Claims

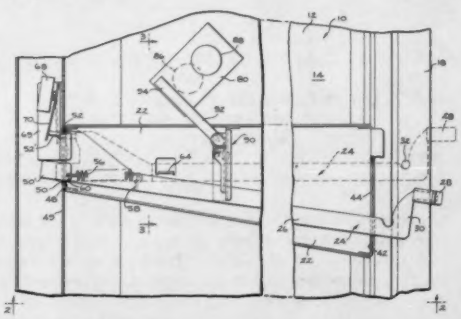


1. A fireplace having a flue, a grate, an ash dump located under the grate, and an ash pit having a clean-out door located below the ash dump, the improvement comprising, in combination, an air diffuser mounted over the ash dump, the air diffuser comprising a hollow box extending upwardly from the ash dump toward the grate, having an open bottom, a top, and perforate side walls to permit the passage of air, and the clean-out door having associated air-control means.

4,136,667
OVEN DOOR LATCH MECHANISM

Walter E. Lewis, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 24, 1977, Ser. No. 780,793
Int. Cl.[2] E05C *19/12*
U.S. Cl. 126—197 15 Claims



1. A high temperature self-cleaning oven comprising a box-

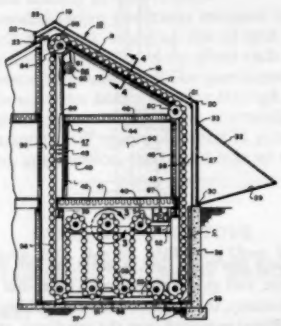
like oven liner and a front-opening access door, heating means for the oven, a latch mechanism for locking the door, said latch mechanism comprising an elongated latch arm that is movable between an open and a closed position, the top portion of the door including a keeper that is engageable by the latch arm, the oven liner including an oxidation unit in cooperation with an exhaust vent for removing the gaseous degradation products during a self-cleaning oven cycle, and a locking means engageable with the latch arm in the closed position when the oven temperature is above about 600° F. so as to render the latch arm inoperable until the oven temperature returns to a temperature below about 600° F., said locking means comprising a thermally responsive means operative in response to the temperature of said oxidation unit and joined with a catch means which when actuated by the thermally responsive means confines the latch arm from further movement at oven air temperatures above about 600° F.

4,136,668

SOLAR HEAT STORAGE AND UTILITY SYSTEM

Ariel R. Davis, 3476 Fleetwood Dr., Salt Lake City, Utah 84111

Filed Apr. 8, 1977, Ser. No. 786,001
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **8 Claims**



1. In a building structure having an occupancy area, a basement heat-storage area disposed at a level underneath said occupancy area, and an upper, radiant energy receiving area, a pair of mutually spaced endless connectors passing into and through said basement heat-storage area and also circumscribing said occupancy area, a series of mutually spaced, elongate, heat storage elements interconnected to and between said endless connectors, means for supporting for movement said endless connectors, and means for progressively driving said endless connectors whereby to advance said heat storage elements toward, proximate, and past said radiant energy receiving area.

4,136,669

SOLAR HEAT COLLECTING MODULE AND MODULAR SYSTEM

George T. Lane, P.O. Box 306, Fleming, Colo. 80728

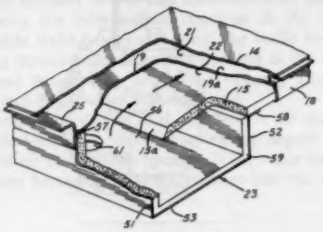
Filed May 16, 1977, Ser. No. 797,351
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **5 Claims**

1. In a solar heat collecting module, the combination comprising:

a generally hollow member having an inner cavity which includes a cover portion for passing solar energy into said inner cavity, a heat-insulating back portion forming an integral structural part of said member, and opposed rigid side rail portions supporting said cover portion and side rail portions in a fixed spaced relation to one another;

a collector plate disposed in said inner cavity having a solar energy absorbing surface with a closed air space formed between said cover portion and said solar energy absorbing surface and a flow passage along the back face of said collector plate and defined in part by said back portion, said collector plate absorbing the solar energy transmitted through said top portion to become heated and in turn heat a stream of air flowing through said flow passage; and

heat-washing means for said collector plate extending into



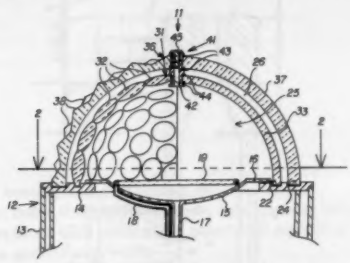
said flow passage from the back face of said collector plate, said heat-washing means including at least one projection arranged generally transverse to the direction of air flow, said projection having a pair of oppositely disposed tapered side edges that converge toward an apex around which the air passes causing a turbulence in the air flowing through said flow passage to enhance the removal of heat from said collector plate into said stream of air.

4,136,670

SOLAR HEATING COLLECTOR APPARATUS

Theodore L. Davis, 21 Meryl St., Medway, Mass. 02053

Filed Jun. 13, 1977, Ser. No. 805,688
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **7 Claims**



1. A solar heating system comprising:

a collector dish for receiving solar heat;

supply means for distributing a heat transfer liquid over said collector dish;

drain means for removing the heat transfer liquid from said collector dish; and

optical director means for directing solar energy onto said collector dish, said director means comprising an array of converging lenses oriented to receive radiant energy from the sun and to direct said energy onto said collector dish, said array of converging lenses comprising a substantially hemispherical optical dome one portion of which is formed by a matrix of double convex lenses oriented so as to have portions facing the sun during substantially an entire day and another portion of which comprises an inner surface that is reflective of radiant energy so as to reflect solar energy toward said collector dish.

4,136,671

ELECTROMAGNETIC RADIATION REFLECTOR

Carl L. Whiteford, 3 High Point Rd., Westport, Conn. 06902

Filed Mar. 24, 1977, Ser. No. 780,807
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 30 Claims

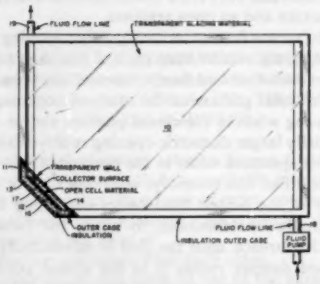
1. A reflector of electromagnetic radiation which comprises:
(a) at least one rectangular sheet of flexbile material having a radiation reflective surface;
(b) support means securing two opposite edges of said sheet a predetermined distance apart and means movably sealing the remaining two opposite edges of said sheet;
(c) said support means including means for substantially gas-tight enclosure of one surface of said sheet;
(d) means applying and maintaining a substantially uniform pressure differential between the surfaces of said sheet for holding said sheet in a substantially cylindrical arc;
(e) said reflective surface being on the concave surface and having a plurality of longitudinal segments angled with respect to said arc for directing substantially all of the parallel rays of electromagnetic radiation striking said surface toward the same longitudinal focal line whereby said reflective surface is effectively a parabola.

4,136,672

FLAT PLATE SOLAR ENERGY COLLECTOR

Lawrence W. Hallanger, 1410 Ambrose, Oxnard, Calif. 93030

Filed Mar. 24, 1977, Ser. No. 780,899
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 10 Claims



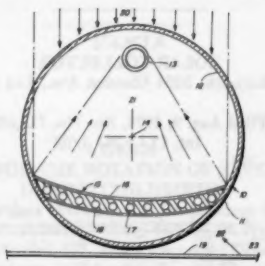
1. A solar energy heat collector comprising:
a. an insulated outer housing;
b. said housing having at least one broad surface, non-insulated wall which is transparent to solar radiation;
c. a flat plate collector within said housing spaced apart from and facing said transparent wall;
d. said flat plate collector consisting of a relatively thin layer of highly porous open cell material encased in a waterproof covering, at least the portion of said waterproof covering which faces said transparent wall being non-transparent and in close contact with said layer of porous open cell material, and operating to absorb and collect solar energy; said porous material also operating to reduce thermal convection;
e. first and second fluid flow means connected along first and second opposite edges, respectively, of said porous open cell layer, and a working fluid operable to flow from said first fluid flow means into, through and across said porous open cell layer to said second fluid flow means while circulating against the inner surface of said non-transparent waterproof covering;
f. the solar energy impinging upon said non-transparent waterproof covering being transferred as heat energy from said non-transparent waterproof collector surface directly to said working fluid as said working fluid passes through said porous layer in intimate contact with the inner surface of said non-transparent energy collecting covering; said heated working fluid also being operable to be directed from said second fluid flow means to a point where it is to be used.

4,136,673

MULTIMODE SOLAR ENERGY COLLECTOR AND PROCESS

William J. D. Escher, 506 S. Clinton Ave., St. Johns, Mich. 48879

Filed Jul. 11, 1977, Ser. No. 814,289
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 13 Claims



1. A multimode solar energy collector comprising: a transparent tubular body portion having end closures sealing each end of said body portion providing a fluid-tight cavity within the tube, a concentrator-reflector within and in fixed relation to the tube, a focal-line solar energy absorber in the focus of said concentrator-reflector, a high temperature fluid conduit in thermal exchange relation with said focal-line solar energy absorber, a diffuse solar energy absorber within the tube in the path of reflected or diffuse solar radiation, a low temperature fluid conduit in thermal exchange relation with said diffuse solar energy absorber, heat exchange fluid in said conduits and means for introducing and withdrawing the heat exchange fluid from said collector, said concentrator-reflector being in the path of direct solar radiation and focusing said direct radiation to said focal-line absorber and said diffuse absorber being in the path of reflected or diffuse solar radiation.

4,136,674

SYSTEM FOR SOLAR RADIATION ENERGY COLLECTION AND CONVERSION

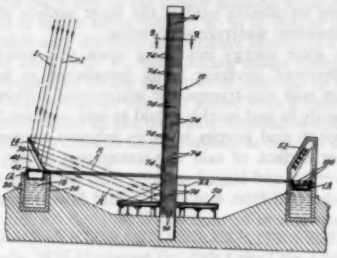
Abraham L. Korr, Philadelphia, Pa., assignor to A. L. Korr Associates, Inc., Philadelphia, Pa.

Filed Jul. 28, 1977, Ser. No. 819,753
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 7 Claims

1. A system for the collection and conversion of solar radiation energy, comprising:
a central absorber of solar radiation energy;

mirror support means, and mirror means positioned on said mirror support means to provide reflection of said solar radiation energy onto said central absorber; and

means for rotating said mirror support means about an axis through said central absorber, at a rate synchronized with the daily apparent east-west motion of the sun, so as to maintain said reflection of said solar radiation energy upon



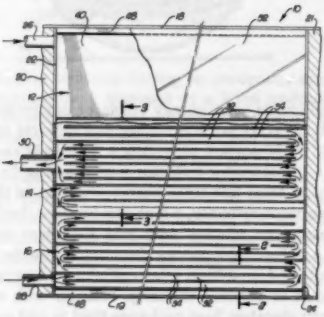
said central absorber during said daily motion of the sun wherein said mirror support means comprises buoyant means on which said mirror means are mounted, said system also comprising flotation means for floating said buoyant means and said means for rotating said mirror support means comprising means for rotating said floating buoyant means wherein said central absorber is secured to the earth, independent of said buoyant means.

4,136,675

SOLAR COLLECTOR

Norman M. Karasick, 3254 Glendon Ave., Los Angeles, Calif. 90034

Filed Aug. 9, 1976, Ser. No. 712,602
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **19 Claims**



1. In a solar collector:

a. extruded absorber means made of high thermal conductivity structural material having a top wall to be exposed to solar radiation, and having a series of side-by-side flow channels separated by a series of ribs substantially all of which extend from said top absorber wall;

b. a bottom wall for said flow channels;

c. end members attached to said absorber means and closing the ends of said flow channels;

d. some of the ribs being cut away adjacent the end members in order to define a serpentine path for transfer fluid in an ultimate direction transverse to the flow channels;

e. each rib being formed in one piece with said top absorber wall whereby a low thermal impedance path free of welds is provided for efficient transfer of thermal energy to the transfer of fluid; and

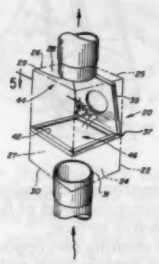
f. supporting means connected to opposite sides of said absorber means for suspending said absorber means, said ribs adding structural strength to said absorber means sufficient to resist excessive deflection under load.

4,136,676

FLUE BOX ASSEMBLY

Letcher I. McCown, Bolingbrook, and Ernest H. Soderlund, Oak Lawn, both of Ill., assignors to Thermiser Manufacturing Corporation, Oak Lawn, Ill.

Filed Dec. 7, 1977, Ser. No. 858,370
Int. Cl.² F23L *11/00, 13/00*
U.S. Cl. 126—292 **7 Claims**



1. An improved flue box assembly for installation in conjunction with a heating plant of the type having a heated fluid outlet emanating from the main furnace box and constructed to improve fuel consumption in the heating plant while permitting fast and efficient waste gas emission under severe back pressure situations, comprising in combination,

a housing formed by a continuous sidewall, a top wall and a bottom wall,

each of said top wall and bottom wall having an aperture,

means associated with each of said top and bottom apertures for accommodating the interconnection thereto of an outlet and inlet conduit respectively,

said housing having an interior diametric opening substantially greater than the diametric opening of said inlet and outlet apertures respectively,

said housing further including damper means spaced a distance below said outlet aperture in said housing and movably positioned within said housing such that said damper means is movable between a closed position overlying said inlet aperture and an open position,

said damper means further including a flue opening sized to be diametrically smaller than each of said inlet and outlet apertures such that said damper means functions to close off a substantial portion of the diametric opening within said housing when in the closed position and to expose a substantially larger diametric opening relative to said inlet and outlet apertures when in the open position,

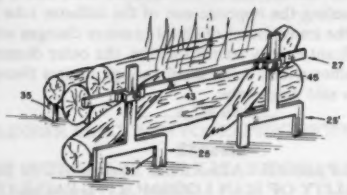
whereby said flue box assembly, when installed in the fluid pathway of the heated fluid outlet emanating from the main furnace box functions to retain the furnace fuel within the furnace until the fuel is substantially burned when said damper means is in the closed position and permitting only waste gases to be emitted through said diametrically smaller flue opening in said damper means, while at the same time permitting a fast and efficient emission of waste gases in the event of any back pressure or minor explosions within the furnace by having said damper means movable to an open position which thereby exposes said substantially greater diametric opening of said housing relative to said inlet and outlet aperture thereby to provide an assembly which permits efficient and substantially complete burning of the fuel within the furnace while at the same time an efficiently safe assembly in the event of back pressure or explosion situations.

4,136,677

GUARD FOR OPEN FIREPLACE

C. C. Mayes, P.O. Box 8, Pigeon Forge, Tenn. 37863

Filed Jul. 8, 1977, Ser. No. 813,865
Int. Cl.[2] F24B *13/00, 7/00*
U.S. Cl. 126—298 3 Claims



1. In a fireplace comprising a floor, a pair of oppositely disposed side walls, a front wall defining an opening and a rear wall disposed opposite said front wall, an andiron system comprising a pair of spaced apart andirons, each of said andirons comprising an elevated generally horizontal log supporting member spaced vertically above and apart from said floor and extending from a location adjacent said front opening toward said rear wall of said fireplace and a post member of non-circular cross section extending generally uprightly from said support member adjacent said front opening of said fireplace, and a log guard comprising a single elongated rigid rod having a length greater than the distance between said andiron post members whereby the ends of said rod project laterally from said post members to extend substantially across the said opening of said fireplace, a pair of spaced apart cuff means fixedly secured to said rod and each defining an opening that is complementary in geometry to said non-circular cross section of said post member and non-pivotably receiving one of said post members, and means supporting said rigid rod substantially horizontally between said andirons in a position generally parallel to said front wall and said floor and above said log supporting member with no substantial portion thereof being disposed below said log supporting members to block said fireplace opening, whereby logs placed upon said log supporting members are restrained from rolling off said andirons in a direction toward said front opening of said fireplace and said andirons are restrained against pivotal movement relative to one another and pantographic-type movement of said andirons and said rod.

4,136,678

METHOD OF ADMITTING SOLUTIONS TO MEDICAL DRAINAGE OR IRRIGATION CONDUITS

Janet Beach, P.O. Box 409, Camden, Me. 04843

Filed Aug. 31, 1976, Ser. No. 719,187
Int. Cl.[2] A61B *19/00*
U.S. Cl. 128—1 R 2 Claims

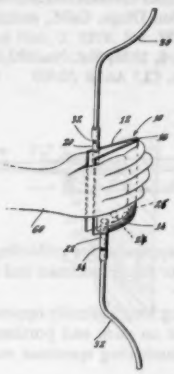
1. A method of admitting solution from a first source into one of a pair of tubes which is connectable into tandem relationship with the other of said pair of tubes, concurrently with admitting solution from a second source into the other of said tubes comprising the steps of

disconnecting said tubes from each other,

connecting one of said tubes to one of the egress means of apparatus comprising a pair of manually collapsible solution containers which are structurally integral with each other without a solution flowpath therebetween, each of which has a solution egress means, the egress means in each of said containers being positioned at the end thereof opposite the end of the other of said containers at which the egress means therein is positioned, wherein said containers are pouch-like and are structurally integrated with each other by means of a hinge-like juncture about which said containers may be swung into contact side-by-side with each other,

connecting the other of said tubes to the other of said egress means, folding said containers over into side-by-side relationship,

concurrently manually squeezing both of said containers,



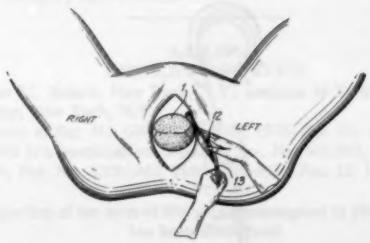
disconnecting both of said tubes from said egress means, and reconnecting said tubes to each other.

4,136,679

PROCESS FOR THE ROTATION OF FETAL HEAD DURING CHILDBIRTH

Eduardo G. Martínez Martínez, 458, St. Domingo St. Guanabacoa; Guillermo Azcarraga Maig, 657, 26 St. Nuevo Vedado; Emilio Soto Méndez, 555, Tres Palacios St. Luyano; Eduardo Rodriguez Calderon, 262, Agucate St., and Nicanor Menéndez Mesa, 9523, Vento Ave. Alta Habana, all of Havana, Cuba

Filed Apr. 2, 1976, Ser. No. 673,102
Claims priority, application Cuba, Apr. 11, 1975, 34249
Int. Cl.[2] A61B *17/42*
U.S. Cl. 128—1 R 4 Claims



1. A process for rotation of the fetal head during childbirth, comprising the steps of: using a force through the agency of spatulas by applying the principle of wheel rotation for rotating the head in any of its presentations of position, to reduce fetal and maternal lesions, as well as the necessity of cesarean sections; rotating the head by applying the force at a point corresponding to the zone of the occipital bone; and utilizing as the axis of rotation, the rotation axis of the head passing through the junction of the cervical column with the fetal occiput.

4,136,680
SELF-CONTAINED APPARATUS FOR COLLECTION AND MAINTENANCE OF MEDICAL SPECIMEN AND METHODS OF USING SAME

Anna M. Southworth, San Diego, Calif., assignor to Transmed Corp., San Diego, Calif.

Filed Jun. 4, 1976, Ser. No. 692,826
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—213 47 Claims

45. A self-contained apparatus for collecting a bacteriological or microbiological or tissue specimen and maintaining said specimen comprising:

chamber means having longitudinally opposing end portions with sealing means on each end portion and containing therein a non-contaminating specimen maintenance environment;

additional closure and sealing means spacedly positioned outwardly and longitudinally of the sealing means on one of said end portion of said chamber means and cooperating with the sealing means on said one end portion to form a sealable air-lock at said one end portion of said chamber means for controlling passage of exterior atmosphere into said chamber, means through said one end portion; and

specimen collecting means movably positioned through said chamber means, each of said end portion sealing means and said air-lock in sealing relationship with said chamber means and said end portion sealing means to form a sealed chamber interior and for extension therefrom to collect said specimen and for retraction thereinto to cooperatively allow entry of said collected specimen into said air-lock and into said sealed chamber interior while maintaining said sealed state of said chamber interior.

4,136,681
CATHETER FOR MEASURING INTRAUTERINE PRESSURE

Edward H. Hon, Bradbury, Calif., assignor to American Home Products Corporation, New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,821
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—2 R 5 Claims

1. An intrauterine catheter for use in measuring intrauterine pressure, comprising:

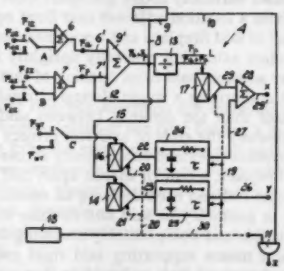
an elongated guide tube having a slot extending its entire length and means for sealing said slot, said guide tube being adapted to be inserted through the vagina and cervix of a woman in labor,

an elongated flexible catheter tube within said guide tube for providing a liquid coupling from a patient's uterus to a suitable pressure measuring device, said catheter tube being filled with liquid and including a plurality of pinholes at the uterine end of the catheter tube, and a diaphragm sealing the opposite end of the catheter tube for enabling the transmission of liquid pressure changes without significant energy transformation, the outer diameter of said catheter tube being small enough to pass through the slot in said guide tube.

4,136,682
APPARATUS PARTICULARLY FOR EVALUATING THE FUNCTIONALITY OF MAN LOCOMOTIVE FACULTIES

Antonio Pedotti, Via Garebaldi 4, Brenta (Varese), Italy

Filed Aug. 30, 1976, Ser. No. 719,030
Claims priority, application Italy, Sep. 4, 1975, 26912 A/75
Int. Cl.[2] A61B *5/10*
U.S. Cl. 128—2 S 2 Claims



1. A human locomotive functionality evaluating apparatus comprising a substantially rigid platform adapted to support a subject walking thereonto and exercising on said platform a force and/or pressure due to said walking; a plurality of force and/or pressure transducing members operatively associated with said platform and adapted to provide a corresponding multiplicity of electrical signals representative of said force and/or pressure on said platform, said apparatus being characterized in that it further comprises a hybrid processor circuitally connected to said plurality of transducing members and adapted to on-line convert onto an output display means the time-space representation of the projection on a plane of the resultant of the forces and/or pressures acting on said platform due to said walking of said subject thereonto, said hybrid processor comprising first and second RC circuit means operatively connected to outputs of sample-hold circuit means, said RC circuit means being driven by clock means and being adapted to provide at the outputs thereof an exponential signal asymptotically going to a value imposed by said sample-hold circuit means.

4,136,683
INTRACELLULAR TEMPERATURE MEASUREMENT

Robert T. Gordon, 4936 West Estes, Skokie, Ill. 60076

Continuation of Ser. No. 670,987, Mar. 25, 1976, abandoned.
This application Mar. 9, 1977, Ser. No. 777,924
Int. Cl.[2] A61B *5/05*
U.S. Cl. 128—2 H 9 Claims

1. A process for the measurement of the intracellular temperature of cells within the body comprising: intracellularly injecting into the patient, minute particles capable of magnetic characteristics and of the size less than 1 micron to permit absorbing said minute particles into the cells, determining the magnetic susceptibility of the intracellular particles with magnetic susceptibility measuring equipment and correlating the

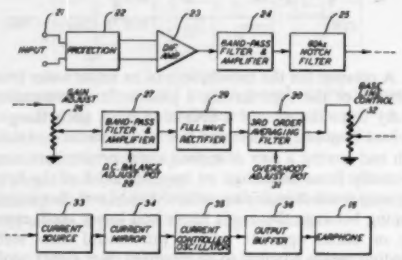
determined magnetic susceptibility to a corresponding temperature of the particles.

4,136,684

LINEAR ELECTROMYOGRAPHIC BIOFEEDBACK SYSTEM

Mark G. Scattergood, and David C. Howson, both of R.D. 2, Trumansburg, N.Y. 14886

Filed Feb. 7, 1977, Ser. No. 766,500
Int. Cl.[2] A61B 5/05
U.S. Cl. 128—2.1 M **3 Claims**



1. An electromyographic biofeedback system for indicating magnitude of muscle activity by measuring voltage on a skin surface adjacent a muscle which is to be measured, comprising:

a transducer adapted to be positioned on a skin surface adjacent a muscle which is to be measured;

high input impedance differential linear amplifier means connected to said transducer for amplifying voltages representing magnitude of muscle activity; said amplifier means eliminating common mode noise and maximizing said voltage representing muscle activity, said amplified means providing a linear amplification of muscle activity voltage over a dynamic range of at least one thousand times a smallest measurable input voltage;

filter means connected to the output of said amplifier means comprising one or more band pass filters adapted to pass a band of frequencies in which the greatest amount of electromyographic activity occurs, for filtering out unwanted information and passing signals in a predetermined desired range of frequencies, said filter means further comprising a rejection filter adapted to reject signals and noise occurring in commonly used electrical power line frequencies;

detection means connected to the output of said filter means for detecting voltages representing muscle activity;

averaging filter means connected to an output of said detection means, said averaging filter means having a rise time of less than 250 milliseconds and having an overshoot of less than 10 percent of maximum signal value, said averaging filter means adapted to provide an output signal representing an instantaneous value of voltage corresponding to muscle activity;

oscillator means connected to the output of said averaging filter means for converting voltage representations of magnitude of muscle activity to a sequence of signals in the audio frequency range; and

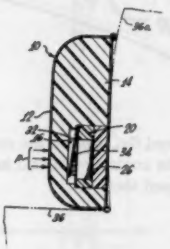
output transducer means for converting said sequence of signals in the audio frequency range into an audible signal for recognition by human being.

4,136,685

CUSHIONED VIBRATING MEANS

Carol Ramey, 6413 Ocean Front Walk, Playa Del Ray, Calif. 90291, assignor to Carol Ramey, Playa Del Rey, Calif. Del Rey, Calif.

Filed Nov. 2, 1976, Ser. No. 737,797
Int. Cl.[2] A61H 1/00
U.S. Cl. 128—33 **6 Claims**



1. A self-contained cushioned vibrating means, which comprises:

a vibratory motor means;

a portable power source;

a pressure-sensitive switching means electrically connected to said vibratory motor means, and to said portable power source for energization and de-energization of said vibratory motor means;

a pressure plate means directly overlying said pressure-sensitive switching means and having a relatively enlarged surface area with respect to said pressure-sensitive switching means; and

a compressible cushioning material completely enclosing said vibratory motor means portable power source, said pressure-sensitive means and said pressure plate means whereby upon the application of external inwardly directed force at any one of a multiplicity of areas on the surface of said compressible cushioning material said pressure plate means is forced into contact with said pressure-sensitive switching means to thereby energize said vibratory motor means for transmission of vibrations, in a damped manner, to the surface of said cushioning material and upon release of said external inwardly directed force upon said compressible cushioning material said pressure plate means is released from contact with said pressure-sensitive switching means to thereby de-energize said vibratory motor means.

4,136,686

ORTHOPEDIC DEVICE

Elmer M. Arluck, New York, N.Y., assignor to Yardney Company, New York, N.Y.

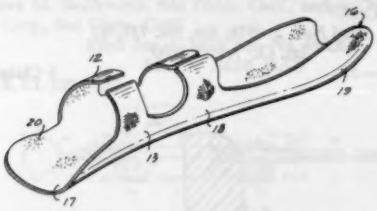
Division of Ser. No. 600,082, Jul. 29, 1975, Pat. No. 4,006,741, which is a continuation-in-part of Ser. No. 465,404, Apr. 29, 1974, Pat. No. 3,906,943. This application Jan. 12, 1977, Ser. No. 758,786
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.[2] A61F 5/04
U.S. Cl. 128—90 **2 Claims**

1. A method of making a shaped device comprising the steps of:

heating a flat sheet consisting of a plastic sheet member of a thickness of 50 to 120 mils, a flexural strength of 3,000 to 14,000 psi, a flexural modulus of 0.5×10^5 to 7×10^5 psi and a Vicat softening point of 60° C to 80° C, an insulating layer having a thickness of at least 10 mils and a coefficient of heat transfer below 2 cal/sec/cm^2/°C $\times 10^{-4}$ on one side of said sheet member, and a protective layer on the other side thereof to a temperature of 120° F to 400° F by

subjecting said sheet to a source of heat at said protective layer;

removing said source of heat;



shaping the heated flat sheet to the contours of a contoured shaping part in contact with said insulating layer; and

cooling the shaped sheet.

4,136,687

WATER RESISTANT ORTHOPEDIC CAST

Winifred C. Dabroski, East Brunswick Township, Middlesex County, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 27, 1977, Ser. No. 846,049

Int. Cl.[2] A61F *13/04*; C04B *11/14*

U.S. Cl. 128—91 R **10 Claims**

1. A water resistant orthopedic bandage having improved water resistance, green strength and dry crush strength which includes a hardenable plaster of Paris composition, including a reactive silicone polymer supported on a flexible carrier.

4,136,688

PROTECTIVE DEVICES

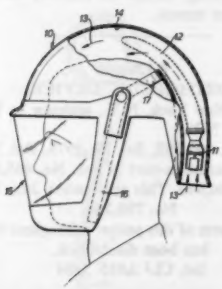
Anthony G. Gorman, Ruislip, England, assignor to Racal-Amplivox Communications Ltd., Wembley, England

Filed Mar. 8, 1977, Ser. No. 775,634

Claims priority, application United Kingdom, Mar. 31, 1976, 13027/76

Int. Cl.[2] A61F *9/06*

U.S. Cl. 128—142.7 **9 Claims**



1. A respiratory helmet comprising means providing filtered air, visor means guiding air in front of the wearer's face, and air flow restricting means restricting the egress of air between said visor means and the sides of the wearer's face said air flow restricting means comprising a supporting member sealed to the lateral edge of the visor means and a multiplicity of bristles extending from said supporting member inwardly of the visor to engage the wearer's face.

4,136,689

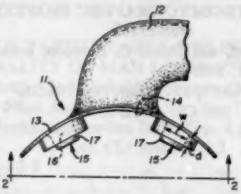
CUSTOMIZED MOUTHPIECE RETAINER FOR AN UNDERWATER BREATHING APPARATUS

Ralph B. Shamlian, San Francisco, Calif., assignor to Farallon Industries, Inc., Belmont, Calif.

Continuation of Ser. No. 608,551, Aug. 28, 1975, abandoned, which is a continuation of Ser. No. 488,035, Jul. 12, 1975, abandoned, which is a division of Ser. No. 402,720, Oct. 2, 1973, Pat. No. 3,844,281. This application Jan. 5, 1977, Ser. No. 757,036

Int. Cl.[2] A62B *7/00*

U.S. Cl. 128—147 **2 Claims**



1. A retainer for the mouthpiece of an underwater breathing apparatus of the type having a pliable flange extending outwardly from the end of a breathing tube, such flange to be received between the lips and the frontal surface of the user's teeth and having a pair of spaced apart projections extending outwardly from the flange on opposite sides of the breathing tube, said retainer including means shaped and dimensioned for gripping between the user's upper and lower teeth essentially only on either opposite side of the central front teeth and including means adapted to be mounted over either projection on the mouthpiece, whereby when a retainer is mounted on each projection, the mouthpiece can be held in the user's mouth with the upper and lower teeth of the user spaced apart to facilitate breathing through the breathing tube, said retainer having a surface, when mounted on each projection and the mouthpiece positioned in the mouth of a user, exposed to the bite of the user, said retainer being made of a material which is thermoplastic at an elevated temperature compatible with use within the mouth of the user and which is moldable while in a thermoplastic state by the bite of the user so as to flow to form an impression of the bite of the user in the material upon cooling thereof, whereby each retainer of the mouthpiece can be customized to the bite of the individual user.

4,136,690

METHOD AND APPARATUS FOR VECTOR ANALYSIS OF ECG ARRHYTHMIAS

Donald L. Anderson, Huntington Beach, and Isaac R. Cherry, Mission Viejo, both of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Filed Oct. 31, 1977, Ser. No. 847,400

Int. Cl.[2] A61B *5/04*

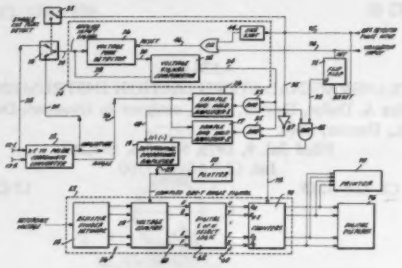
U.S. Cl. 128—2.06 A **22 Claims**

1. Apparatus for use in analyzing successive ECG signatures in two-channel vector electrocardiographic signals for sensing the vector angle at the peak of the QRS complex and the vector angle at the peak of the T wave, for determining the difference between the vector angles, and for counting the number of times during a predetermined time interval the angular difference falls within predetermined angular limits, comprising:

peak-determining means responsive to an applied input signal for sensing the peak of the QRS complex and producing a first sampling signal when it occurs, and for sensing the peak of the T wave and producing a second sampling signal when it occurs;

a rectangular-to-polar coordinate converter responsive to the two-channel electrocardiographic signals to produce a magnitude signal and an angle signal;

sample-and-hold means connected to said peak-determining means, and connected to said rectangular-to-polar coordinate converter, and responsive to said first sampling signal to produce a first sampled angle signal equal to the value of the angle signal at the time of occurrence of the first sampling signal, and responsive to said second sampling signal to produce a second sampled angle signal equal to the value of the angle signal at the time of occurrence of the second sampling signal;



difference means connected to said sample-and-hold means for producing an output difference signal equal to the difference between the first sampled angle signal and the second sampled angle signal; and,

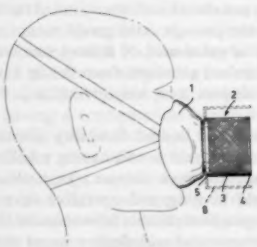
classifying means connected to said difference means for counting the number of difference signals having amplitudes within a predetermined angular range.

4,136,691

RESPIRATION MASK

Olavi A. Ebeling, and Risto W. Lunden, both of Helsinki, Finland, assignors to Oy Kontekla, Helsinki, Finland

Filed Apr. 8, 1977, Ser. No. 785,844
Claims priority, application Finland, Apr. 30, 1976, 761218
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—217 **4 Claims**



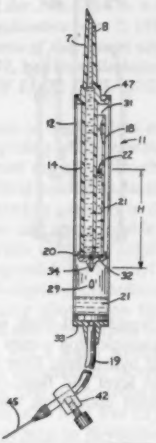
1. A respiration mask comprising a mask portion for covering the mouth and nose of a person, said mask portion having a respiration opening therein, and a heat exchanger through which inhalation and exhalation air flows for the recovery of the heat and humidity contained in the exhalation air and for the transfer thereof to the inhalation air, said heat exchanger including a pile of superimposed woven wire nettings formed from at least one continuous strip of wire netting wound helically to form a cylindrical netting roll comprising several turns, said netting roll at one axial end being connected to said respiration opening in the mask portion and means closing the other end of said roll so that the flow of air takes place radially through the netting roll in alternately opposite directions during inhalation and exhalation.

4,136,692

FLOW METER ADMINISTRATION DEVICE

Michael Goldowsky, 7 Greenwood La., Valhalla, N.Y. 10595

Continuation-in-part of Ser. No. 659,220, Feb. 19, 1976, abandoned. This application Feb. 4, 1977, Ser. No. 765,561
Int. Cl.[2] A61M *5/16*
U.S. Cl. 128—214 C **11 Claims**



1. A flow meter device including fluid inlet and outlet means comprising:

(a) a first and a second fluid passage means having upper and lower portions, the upper portion of the first passage means being in communication with the inlet means;

(b) a passageway interconnecting the lower portions of the first and second passage means;

(c) a drip chamber enclosing the first and second passage means, the top of said second passage means vented to the drip chamber,

(d) indicia means associated with the device and adapted for indicating the level of a liquid in the second passage means; the diameter of said second passage means being sufficiently small to give a fast response to changes in flow;

(e) thin disc means having an orifice and located approximate the lower portions of the first and second passage means and adapted for out flow of liquid from the first and second passage means; the thickness of said orifice is generally in the range of from a fraction of a thousandth of one inch to 0.035 inch for obtaining high flow rate accuracies with fluids of differing kinematic viscosities.

4,136,693

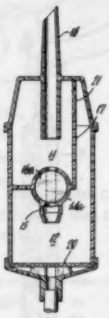
CONSTANT FLOW I.V. DEVICE

Denis G. Dyke, Edinboro, Pa., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed May 10, 1977, Ser. No. 795,579
Int. Cl.[2] A61M *5/16*
U.S. Cl. 128—214 C **14 Claims**

1. An apparatus for gravity fed delivery of a liquid from a liquid reservoir to a patient which comprises a housing including an upper chamber, means for passing said liquid from said liquid reservoir to said upper chamber, means for maintaining a predetermined volume of said liquid in said upper chamber, said predetermined volume being less than the total volume of said upper chamber, thereby providing a non-liquid containing volume in said upper chamber, a lower chamber, liquid communication means between said predetermined volume of liquid and said lower chamber, operable to pass said liquid from said upper chamber to said lower chamber in the form of droplets, means for passing said liquid from said lower cham-

ber to said patient which include a port operably sealed by a hydrophilic filter which will pass said liquid, but will not pass gases therethrough, said means for passing said liquid from said lower chamber to said patient, further including liquid collecting means below said filter having a finite volume and capable



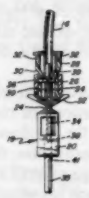
of maintaining said liquid level flush with said hydrophilic filter, said liquid communication means passing said droplets into contact with said hydrophilic filter prior to said droplets contacting said liquid level and fluid communication means between said non-liquid containing volume and said lower chamber.

4,136,694

SEPARABLE INTEGRAL DONOR TUBE UTILIZING AN INTEGRAL PLASTIC MEMBER WITH TUBE CLAMP

Robert L. Kuehn, Newport Beach, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 10, 1977, Ser. No. 805,364
Int. Cl.[2] A61M *05/00*
U.S. Cl. 128—214 D **1 Claim**



1. In a flexible blood tube, communicating with a blood bag, means for parting said blood tube and exposing an internally mounted needle carried by and communicating with said tube for penetrating a closure of a sample tube, the improvement comprising:

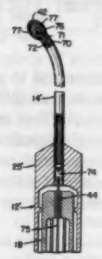
said means being defined by an integral plastic member, said plastic member being positioned to sealingly enclose an interrupted portion of said blood tube and said needle, a thin-walled, frangible portion of said integral plastic member positioned to permit the separation of the plastic member into two pieces by breaking of said frangible portion, to expose said needle for use and separate said blood tube, and manually operated means for shutting off flow through said blood tube at a point on the opposite side of said plastic member from said blood bag, said manually operated means including a collet member positioned on the plastic member, and clamping jaw means, actuated by manual manipulation of the collet member, to press a portion of said blood tube into collapsed, sealed configuration to prevent flow therethrough, said collet member being freely longitudinally movable along said plastic member for quick actuation, and said clamping jaw means comprising an integral component of said plastic member.

4,136,695

TRANSVAGINAL STERILIZATION INSTRUMENT

Charles A. Dafoe, Denver, Colo., assignor to Gynetech-Denver, Inc., Denver, Colo.

Filed Jul. 9, 1975, Ser. No. 594,269
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—215 **12 Claims**



1. A hypodermic needle assembly adapted for insertion into the uterus comprising in combination:

an outer elongated housing open at its rearward end and substantially closed at the opposite forward end except for an axially extending guide passage therein, and a first finger-engaging means at the open end;

elongated hollow needle guide means extending forwardly from said housing as a continuation of said guide passage and terminating in a rounded tip at its forward extremity, closure means associated with the rounded tip to normally close said guide passage, said guide means adapted to guide slidable advancement of at least one needle therethrough for forward extension from the tip at an angle of 10°–15° with respect to a longitudinal axis through the housing;

at least one needle of limited flexibility disposed in said needle guide means, said needle having a hollow interior, needle advancing means disposed in inner concentric relation to said housing and operative to support said needle for longitudinal slidable advancement through said needle guide means and said closure means and to extend for a predetermined distance beyond said tip, said needle advancing means connected to said needle and extending rearwardly therefrom and terminating in second finger-engaging means adjacent to said first finger-engaging means on said housing and said first finger-engaging means manipulable with one hand to advance said needle forwardly with respect to said housing and said needle guide means, and

liquid-containing cartridge means disposed in inner concentric relation to said housing and rearwardly of said needle, said cartridge means being adapted to be slidable forwardly by manipulation with the same hand into liquid communication with the interior of said needle and to force fluid therethrough by manual depression of said cartridge means forwardly through said housing.

4,136,696

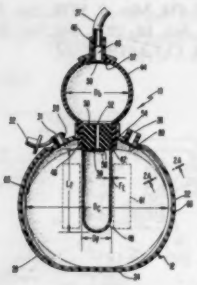
SELF-CONTAINED, COMBINED IRRIGATOR AND EVACUATOR FOR WOUNDS

John R. Nehring, Woodcliff Lake, N.J., assignor to International Paper Company, New York, N.Y.

Continuation-in-part of Ser. No. 568,205, Apr. 5, 1975, Pat. No. 3,983,872, and Ser. No. 587,142, Jun. 16, 1975, Pat. No. 4,022,209, each is a continuation-in-part of Ser. No. 417,124, Nov. 19, 1973, Pat. No. 3,889,677. This application Oct. 4, 1976, Ser. No. 729,094

Int. Cl.[2] A61M *1/00*

U.S. Cl. 128—278 23 Claims



6. A self-contained combined irrigator and evacuator for use in bathing a wound with an irrigated liquid and removing liquid from the wound, comprising:

(a) a substantially rigid container having substantially flat first and second spaced apart side walls, third and fourth side walls joined to the opposite ends of and spaced apart farther than said first and second side walls, and a bottom wall joining all four side walls, said four side walls being joined at their tops to form an irrigation port communicating with the interior of said container;

(b) a substantially cylindrical, resilient bladder having a single opening, said bladder being within said container and said bladder opening being in fluid flow communication with said irrigation port, said third and fourth side walls having a configuration substantially conforming to the natural, unimpeded shape of the adjacent portion of said bladder when inflated;

(c) an inlet passageway in one of said third and fourth side walls and an outlet passageway in the other of said third and fourth side walls, said passageways communicating with the interior of said container and being proximate to and on opposite sides of said irrigation port;

(d) means for selectively permitting and preventing fluid flow through said passageways;

(e) means in fluid-flow communication with said irrigation port for simultaneously inflating and filling said bladder against its resilient bias with said irrigating liquid; and

(f) means for preventing fluid flow between the interior of said bladder and the interior of said container exterior said bladder, the former being a pressure-irrigating section wherein the bias of the bladder when inflated and filled tends to expel said irrigating liquid under positive pressure through said irrigation port and the latter being a suction-evacuating section wherein deflation of said bladder creates a negative pressure in said container which may be used to aspirate fluid through said inlet passageway.

4,136,697

FIBERS OF HIGH FLUID-HOLDING CAPACITY

Frederick R. Smith, Wilmington, Del., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Division of Ser. No. 625,445, Oct. 24, 1975, Pat. No. 4,041,121, Ser. No. 530,476, Dec. 6, 1974, Pat. No. 3,951,889, and Ser. No. 309,076, Nov. 24, 1972, Pat. No. 3,919,385, said Ser. No. 625,445, is a continuation-in-part of Ser. No. 309,290, Nov. 24, 1972, abandoned, said Ser. No. 530,476, is a division of said Ser. No. 309,076. This application Nov. 7, 1975, Ser. No. 629,952

The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.[2] A61F *13/20*; C08L *1/02*; D01F *2/08*

U.S. Cl. 128—285 19 Claims

1. Alloy rayon fibers of higher fluid-holding capacity than non-alloy rayon, comprising a regenerated cellulose matrix and a water soluble polymer dispersed therein in an amount sufficient to increase the fluid-holding capacity by more than 20% and to attain a fluid-holding capacity in the Syngyna test of at least five cc per gram, said water soluble polymer comprising an N-vinylamide polymer which is a polymer of one or more of the monomers vinylpyrrolidone, N-vinyl lactam, a N-vinyl-2-oxazolidinone or a N-vinyl-3-morpholinone.

9. Process for making alloy rayon fibers, of higher fluid-holding capacity than non-alloy rayon, comprising a regenerated cellulose matrix and a water soluble polymer dispersed therein in an amount sufficient to increase the fluid-holding capacity by more than 20% and to attain a fluid holding capacity in the Syngyna test of at least five cc per gram, said water soluble polymer comprising an N-vinylamide polymer which is a polymer of one or more of the monomers vinylpyrrolidone, N-vinyl lactam, a N-vinyl-2-oxazolidinone or a N-vinyl-3-morpholinone which comprises spinning into a coagulating bath a blend of viscose and said water-soluble polymer to form fibers, the proportions of said dispersed polymer being at least about 7% of the total.

18. A vaginal tampon comprising a mass of fibers of claim 1.

4,136,698

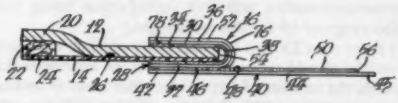
DIAPER WITH TAB FASTENER HAVING GRIPPABLE ADHESIVE-FREE END REGION

Frederick K. Mesek, Downers Grove, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 20, 1976, Ser. No. 734,204

Int. Cl.[2] A61F *13/16*

U.S. Cl. 128—287 10 Claims



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet juxtaposed with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and a pair of adhesive tab fasteners each comprising:

a backing web folded over to form first and second anchoring legs each having an inner face and an outer face, said backing web extending around and receiving a portion of the lateral margin of the diaper therebetween, and said inner face of said anchoring legs being provided with an adhesive coating by means of which said anchoring legs are permanently attached to the diaper marginal portion;

a face web having a fixed end, a grippable adhesive-free region at the opposite end of said face web, and a free working portion situated between said fixed end and said adhesive-free region, a continuous layer of pressure-sensitive adhesive being provided on one face of said face web

and coextensive with said fixed end and said free working portion, said fixed end being permanently attached to said second leg by means of said adhesive layer; and

release means releasably attached to said adhesive layer on said free working portion;

said grippable adhesive-free region extending inwardly away from said lateral margin of the diaper and beyond said release means and said backing web when the tab fastener is in a storage position, and said free working portion being separable from said release means to make said free working portion available for use in securing said diaper about an infant.

4,136,699

ABSORBENT ARTICLE WITH ADHESIVE STRIP

James A. Collins, North Oaks, and Thomas H. Quinn, St. Paul, both of Minn., assignors to H. B. Fuller Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 590,936, Jun. 27, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 760,831

Int. Cl.[2] A61F *13/16*; C08K *5/01*; C09J *7/02*

U.S. Cl. 128—290 R **7 Claims**

1. In an article for absorbing fluids, the structure comprising:

(a) an elongated absorbent pad having essentially two major surfaces;

(b) an outer layer in adherent contact with at least one of said two major surfaces;

(c) a hot-melt pressure sensitive adhesive layer adhered to the outwardly facing surface of said outer layer, said hot-melt pressure-sensitive adhesive having a viscosity of 500 to 15,000 centipoise at its pour temperature, said pour temperature ranging from about 300° to about 400° F., said hot-melt pressure-sensitive adhesive comprising:

(i) 10–20% by weight of a rubbery copolymer selected from the group consisting of a radial block-copolymer, an A-B-A block copolymer, and mixtures thereof, said radial block copolymer being a teleblock copolymer comprising molecules having at least three polymerized butadiene branches radially branching out from a central hub, each said branch having polystyrene terminal blocks; said A-B-A block copolymer having polystyrene end blocks and a rubbery, essentially saturated, poly(mono-olefin)-like midblock,

(ii) more than 120 but less than 500 parts by weight, per 100 parts by weight of said rubbery copolymer of an essentially hydrocarbon oil selected from the group consisting of naphthenic oils, paraffinic oils, and mixtures thereof; the amount of said oil in said hot-melt pressure-sensitive adhesive composition being within the range of 15 to 40% by weight;

(iii) more than 250 but less than 500 parts per 100 parts by weight of said rubbery copolymer, of terpene tackifier resin; the amount of terpene tackifier resin in said composition being within the range of 40 to 60% by weight.

5. A hot-melt pressure-sensitive adhesive composition having a Brookfield viscosity ranging from about 500 to 15,000 centipoise at the pour temperature, said pour temperature ranging from about 300° to about 400° F., said composition being substantially free of solvents with a boiling point below 200° C. at atmospheric pressure and consisting essentially of:

(a) 10–20% by weight of a rubbery A-B-A block copolymer having polystyrene end blocks and a rubbery, essentially saturated, poly(mono-olefin)-like midblock, said A-B-A block copolymer being at least partially incompatible with terpene tackifying resins, said A-B-A block copolymer having a modulus at 300% extension of at least about 500 p.s.i. and an ultimate tensile strength in excess of about 2,000 p.s.i.;

(b) from about 300 to about 400 parts by weight, per 100 parts by weight of said A-B-A block copolymer, of terpene tackifier resin; the amount of said terpene tackifier resin in said composition ranging from 40 to 60% by weight;

(c) from about 150 to about 350 parts by weight of an essentially hydrocarbon oil selected from the group consisting of naphthenic oils, paraffinic oils, and mixtures thereof; the amount of said essentially hydrocarbon oil in said composition ranging from 15 to 40% by weight;

said pressure-sensitive adhesive composition having a measurable 500% modulus at 23° C., being resistant to cohesive failure in P.S.T.C.—1 180° peel strength tests throughout the aforementioned range of essentially hydrocarbon oil content, and exhibiting P.S.T.C.—1 values in excess of about 4 pounds per inch width.

4,136,700

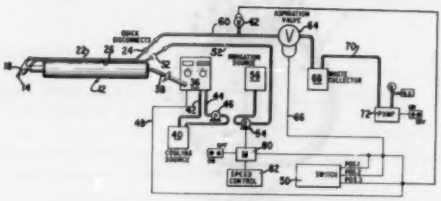
NEUROSONIC ASPIRATOR

Alan Broadwin, Brooklyn, N.Y.; Steven N. Weiss, Laguna Niguel, Calif., and Stanley H. Enker, Lawrence, N.Y., assignors to Cavitron Corporation, New York, N.Y.

Division of Ser. No. 555,474, Mar. 5, 1975, Pat. No. 4,016,882. This application Jun. 14, 1976, Ser. No. 696,321

Int. Cl.[2] A61B *17/32*

U.S. Cl. 128—305 **12 Claims**



1. Apparatus for removing an exposed layer of soft tissue such as neurological-type tissue, said apparatus comprising:

a tool tip having a longitudinal axis extending from one end of said tool tip; and

a connecting member extending from said tool tip for connecting said tool tip to ultrasonic means such that said ultrasonic means ultrasonically vibrates said tool tip flexurally and said one end of said tool tip substantially entirely transversely to said longitudinal axis of said tool tip, whereby said transversely vibrating end of said tool tip can be swept back and forth across said exposed layer of soft tissue in a plane generally parallel to said transverse vibration of said tool tip end to comminute and thereby remove said exposed layer of soft tissue.

4,136,701

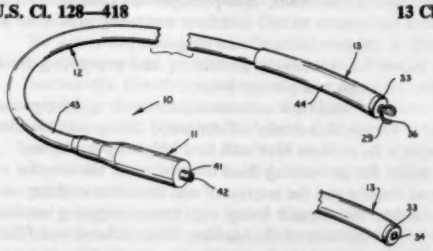
RETRACTABLE STIMULATION ELECTRODE APPARATUS

Steven A. Barton, 401 S. Brazosport Blvd., Freeport, Tex. 77541, and Steven G. Anderson, 107 Poinciana Dr., Lake Jackson, Tex. 77566

Filed Dec. 9, 1977, Ser. No. 858,954

Int. Cl.[2] A61N *1/04*

U.S. Cl. 128—418 **13 Claims**



1. Retractable tissue engaging electrode apparatus, comprising:

an electrically conductive signal lead means;

electrode body means connected to said signal lead means

and having a conductive portion intended for signal transfer contact with body tissue;

tissue engaging means associated with said electrode body means and operative to engage body tissue so as to maintain said conductive portion in predetermined signal transfer contact;

rotatable means within said electrode body means; and

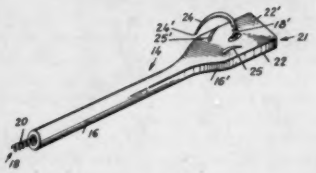
means operatively associated with said rotatable means to non-rotatably extend or withdraw said tissue engaging means in response to rotation of said rotating means.

4,136,702

CATHETER-TYPE ELECTRODE MEMBER FOR AN IMPLANTABLE PACEMAKER

Hector O. Trabucco, 2926 Av. Santa Fe, Buenos Aires, Argentina

Filed Feb. 7, 1978, Ser. No. 875,849
Claims priority, application Argentina, Feb. 14, 1977, 266538
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—418 **1 Claim**



1. A catheter-type member for an implantable pacemaker, insertable from without through the epicardium into the heart muscle for cardiac stimulation, comprising:

a holder of dielectric material including a stem and an enlarged elastic pad having a substantially flat major surface;

conductor means connectable to an external source of electric pulses, said conductor means extending through said stem into said pad and forming therein a helically coiled portion projecting outwardly from said major surface, said helically coiled portion terminating beyond said major surface in an arcuately curved electricity conducting hook of generally semi-circular shape, rising from the outwardly projecting helically coiled portion and being located above said major surface and having a tip pointing back towards said major surface;

at least one stationary generally straight shaped spaced-apart anchoring needle projecting beyond and diverging from said substantially flat major surface at such an angle that its axis crosses at an acute angle the tangent line passing said generally semi-circular shaped-hook at the point of connection with the outwardly projecting helically coiled portion.

4,136,703

ATRIAL LEAD AND METHOD OF INSERTING SAME

Frederik H. M. Wittkampf, Brummen, Netherlands, assignor to Vitatron Medical B.V., Dieren, Netherlands

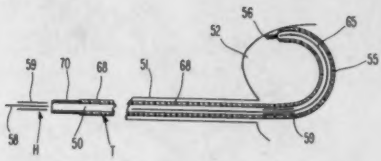
Filed Mar. 9, 1978, Ser. No. 884,917
Int. Cl.[2] A61N *1/04*
U.S. Cl. 128—419 P **15 Claims**

1. A lead particularly adapted for placement in a patient's atrium, comprising:

an encased conductor portion running substantially the length of said lead and containing a lumen along the axis thereof, having an electrical conductor for conducting signals between a first proximal end of said lead and the distal end;

an electrode in fixed mechanical and electrical contact with said electrical conductor at said distal end of said lead adapted for delivering signals to and sensing signals from said atrium;

stylet means adapted for insertion within said lumen and for cooperation with said encased conductor portion for causing the axis of said conductor portion to take a curvilinear form at the distal end of said conductor portion; and



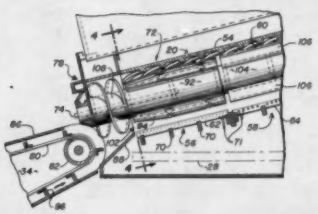
said stylet means comprising an element with a preset curve portion and means for introducing into said conductor distal portion a portion of said preset curve portion and for restraining the remainder of said preset curve portion from assuming its preset form, whereby said conductor distal portion maintains only the curve of said introduced portion.

4,136,704

ROTOR FOR A COMBINE

Calvin J. Dyke, Mt. Morris, Ill., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Feb. 19, 1976, Ser. No. 659,602
Int. Cl.[2] A01F *12/18*
U.S. Cl. 130—27 T **7 Claims**



1. In an axial flow type harvesting machine having a generally fore-and-aft extending axial flow type threshing and separating mechanism which includes generally fore-and-aft extending casing means of generally cylindrical cross section, said casing means having a front threshing concave; rotor means which includes a generally cylindrical main body portion having a substantially uniform diameter, said rotor means being rotatably mounted in said casing means and cooperable with said casing means upon rotation for providing flow of crop material through said casing means in a generally spiral path; and feed means in the form of an auger with flighting mounted forwardly of said main body. portion of said rotor means; the improvement comprising in combination therewith;

at least one threshing element extending radially outwardly from the surface of the main body portion for cooperating with said casing means to thresh crop material;

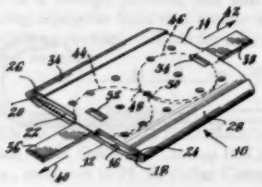
said threshing element being positioned rearwardly of said auger and including front and rear portions, said front portion being inclined outwardly and rearwardly from the front end of said rotor means to facilitate the smooth flow of crop material through said mechanism.

4,136,705

HAIR ROLLER

Walter J. Kulpa, Norwalk, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed Nov. 15, 1976, Ser. No. 741,919
Int. Cl.[2] A45D 2/00
U.S. Cl. 132—40 4 Claims



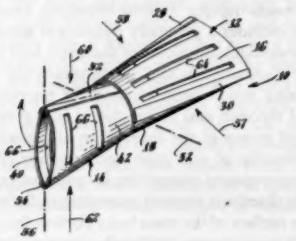
1. An improved hair roller comprising in combination, a pair of resiliently flexible rectangular shaped elongated substantially flat roller members each having a pair of opposed elongated marginal segments terminating in longitudinal edges, said roller members arranged in overlying relationship to each other with said marginal segments arranged in adjacent parallel pairs extending in the longitudinal direction, means attached to each of said adjacent pairs of said marginal segments in bridging relationship to at least one of said longitudinal edges of said pairs of marginal segments for hinge coupling one of said roller members to the other of said roller members, said hinge-coupled members being resiliently deflectable from said overlying relationship to an arcuate shaped spaced apart relationship to form a generally hollow cylindrical shaped roller body, means attached to at least one of said roller members for releasably maintaining said roller body in said cylindrical shaped configuration, said roller body being substantially resistant to bending and buckling from externally applied finger force and the resiliency of said roller members urging said roller body into a substantially flat configuration upon release of said maintaining means, the improvement comprising in that said marginal segments each having a preformed arc shaped transverse cross sectional configuration for conforming the surface of the marginal segments to the circular arc of said cylindrical shaped configuration of the roller body upon deflecting said hinge-coupled roller members into said roller body.

4,136,706

HAIR ROLLER

David L. Haas, Norwalk, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.

Filed Nov. 15, 1976, Ser. No. 741,921
Int. Cl.[2] A45D 2/00
U.S. Cl. 132—40 7 Claims



1. A hair roller resiliently expandable from a substantially flat storage configuration into an elongated generally cylindrical-shaped body which is substantially resistant to bending and buckling to externally applied finger force and which can be readied for use by mutual rotation of a pair of hinge coupled bodies arranged in a telescoping assembly, said hair roller comprising;

a. two resiliently flexible, rectangular-shaped, substantially flat, body members having substantially the same length and width,

b. each of said body members having opposed corresponding marginal portions terminating in longitudinally extending edges, said body members being arranged in an overlying relationship with said longitudinal edges of one of the body members in an aligned coextensive relationship with the corresponding longitudinal edges of the other body member,

c. means secured to said marginal portions of the body members for hinge coupling said body members to each other along said aligned coextensive edges and forming a first substantially flat hinge coupled body, said hinge coupled body having an axis extending through said opposed hinge coupled longitudinal edges transverse of said body members,

d. a second substantially flat hinge coupled body constructed in the same manner as said first hinge coupled body and dimensioned for insertion between the overlying body members of the first hinge coupled body, said first and second hinge coupled bodies being arranged in telescoping assembly in said generally flat configuration with the transverse axis of the first hinge coupled body and the transverse axis of said second hinge coupled body aligned in substantially the same plane,

e. said first and said second hinge coupled bodies being resiliently deflectable under externaly applied finger force and mutually rotatable for positioning said bodies with said transverse axes at a substantially normal relationship to each other forming a hair roller having a generally cylindrical-shaped configuration,

f. said second hinge coupled body resiliently engaging said first hinge coupled body in said substantially normal relationship of the axes for maintaining said hair roller in said cylindrical-shaped configuration with said transverse axes forming diametrical axes of said cylindrically-shaped hair roller.

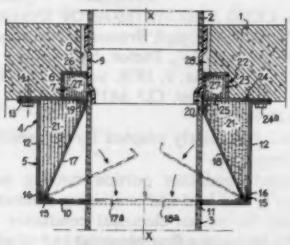
g. said hair roller assuming said substantially flat configuration upon mutual rotation of said hinge coupled bodies to said substantially same plane arrangement of said transverse axes.

4,136,707

FIRE-RESISTING DEVICE FOR PIPING EXTENDING THROUGH A WALL

Jean-Paul Gaillot, Laxou, and Bernard P. Kirch, Pont-a-Mousson, both of France, assignors to Pont-a-Mousson S.A., Nancy, France

Filed Aug. 24, 1977, Ser. No. 827,416
Claims priority, application France, Aug. 31, 1976, 76 26232; Nov. 5, 1976, 76 33440
Int. Cl.[2] F16K 17/36
U.S. Cl. 137—75 26 Claims



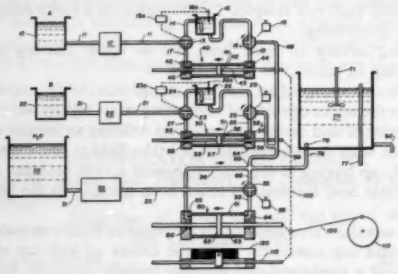
1. A fire-resisting device for interconnecting two pipes of a

piping extending through a wall, and in particular a horizontal flooring, comprising an annular case having a first portion which projects from the wall and a second portion which is embedded in said wall, a tubular element which is connected to the two pipes and defines a passage through the case and comprises a first section and a second section located respectively in the first portion and the second portion of the case, said tubular element being of a material which is rigid at ordinary temperature and capable of softening under the effect of heat, at least said first section being of a fusible material having a distinct fusion point, means combined with said first portion of the case for instantaneously closing said passage as soon as said first section has disappeared, and a material which is capable of radially swelling under the action of heat filling said second portion of said case.

4,136,708
HEMODIALYSATE BLENDING SYSTEM

Louis C. Cosentino, Wayzata, Minn., and Stuart L. Gallant, Pikesville, Md., assignors to Renal Systems, Inc., Minneapolis, Minn.

Filed Jun. 8, 1977, Ser. No. 804,505
Int. Cl.² B67D 5/52
U.S. Cl. 137—99 **24 Claims**



1. A blending system for preparation of variable hemodialysates from multiple fluid concentrate sources and water in controlled proportion, comprising: a plurality of cylinder and piston pump assemblies; means operating said pump assemblies simultaneously; fluid connection means for connecting said pump assemblies to a plurality of fluid sources to be metered, said fluid connection means including valve means for separately controlling fluid flow to and from each of said pump assemblies; position sensor means associated with said pump assemblies for producing signals indicative of the position of the pistons within the cylinders of said pump assemblies; control means connected to receive said position indicative signals and connected to said valve means in controlling relationship, said control means being operable to separately control the operation of the valve means associated with each of said pump assemblies as predetermined functions of piston position so as to control the volume of fluid metered by each of said pump assemblies during a pump stroke.

4,136,709
FLANGE VALVE HAVING IMPROVED SEALING CHARACTERISTICS AND WEAR INDICATOR

Philip W. Rogers, and Claude E. Parkin, Mexico City, Mexico, assignors to A. Dean Mammel, Dallas, Tex.

Filed Jun. 14, 1976, Ser. No. 695,973
Int. Cl.² F16L 7/00
U.S. Cl. 137—375 **4 Claims**

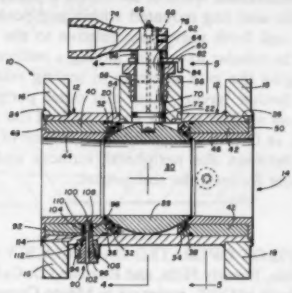
1. A flange valve comprising:

an integral metal valve body with a longitudinal central passage therethrough and having outwardly directed annular housing flanges at the ends thereof for connection to conduits,

an ellipsoid valve member pivotally mounted within said central passage and having an aperture extending therethrough,

annular resilient seats disposed within said passage and having inner annular portions with surfaces in contact with end portions of said valve member,

a pair of removable annular liners disposed in opposite ends of said valve body and having end portions abutting said inner portions of said resilient seats, and liners dimensioned to be removably inserted from the exterior of said valve body into opposite ends of said central passage of said valve body to form a close fit such that said liners may be removed for repair or replacement from said central passage by sliding said liners in an outward direction along said central passage without the requirement of



disassembly of said valve body; said liners constructed from non-corrosive material to prefent corrosion of said valve body, said liners having annular liner flanges which abut against the outer ends of said valve body and for being held in place by the conduits attached to said housing flanges,

annular spacer rings having first and second ends and being disposed between said valve body and said annular liners with said first ends bearing against said resilient seats,

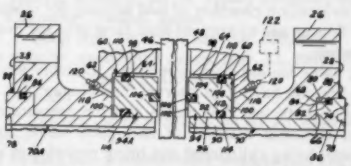
said liner flanges engaging said second ends of said spacer rings to press said first ends of said spacer rings against said resilient seats to urge said resilient seats against said valve member, and

means for rotating said valve member to open and closed positions.

4,136,710
FLOATING SEAT STRUCTURE FOR GATE VALVES

John A. Bond, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Oct. 11, 1977, Ser. No. 840,868
Int. Cl.² F16L 7/00
U.S. Cl. 137—375 **4 Claims**



1. A gate valve structure comprising a valve body having a valve chamber therein and inlet and outlet flow passages communicating with the valve chamber, an expanding valve assembly including a gate element and segment slidably mounted within the valve chamber for movement between open and closed positions of the valve assembly with said gate element

and segment expanding away from each other at the fully closed position;

said valve body having a counterbore about each flow passage adjacent the valve chamber to define an annular recess having a rear wall and an outer circumferential wall, said valve body having an end flange about each of the flow passages, each end flange havng an outwardly facing annular recess about the flow passage therein;

a tubular insert fitting within the flow passage having cylindrical main body of a uniform cross section defining the flow passage and an annular flange about the outer end of said cylindrical main body fitting within the recess of the end flange, the inner end portion of said insert being positioned closely adjacent the gate assembly and having an outer peripheral surface defining with the rear and outer circumferential walls of the recess a pocket; and

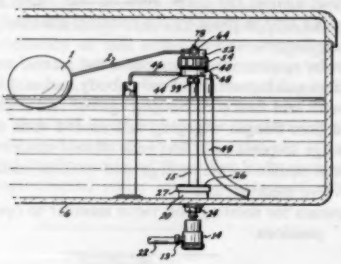
a metallic seat ring mounted within said pocket for floating back and forth movement relative to the gate assembly and the tubular insert and having a resilient face seal for engaging the gate assembly in sealing relation, said seat ring further having inner and outer peripheral surfaces with an annular groove about each of the peripheral surfaces, an O-ring being positioned in each of the grooves to seal between the peripheral surfaces and the adjacent surfaces forming the seat pocket.

4,136,711

PILOT OPERATED BALL COCK VALVE

Sol R. Rubin, Beverly Hills, and Raymond D. Gates, Huntington Beach, both of Calif., assignors to Masco Corporation, Taylor, Mich.

Filed May 23, 1977, Ser. No. 799,502
Int. Cl.[2] F16K *31/34*
U.S. Cl. 137—414 **10 Claims**



1. A pilot operated ball cock valve for controlling liquid in a tank, comprising a housing having a pressure chamber and evacuation chamber contained within said housing;

first means contained within said housing for discharging fluid into the evacuation chamber from which fluid flows into the tank;

diaphragm means mounted between the pressure chamber and evacuation chamber of said housing for closure upon said first means to prevent fluid flow into the evacuation chamber;

a pilot valve having a valve member rotatably mounted in said housing having an internal fluid channel for communication with said first means and the pressure chamber upon sufficient rotation of said pilot valve, the valve member being cylindrical and being mounted in a bore in said housing, and sealing means sealing the valve member with respect to the bore;

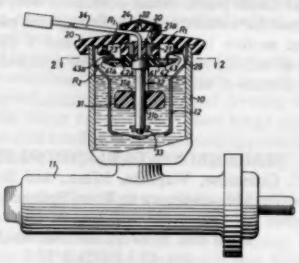
second means for rotating said pilot valve responsive to the height of fluid in a tank such that communication of said internal fluid channel with the pressure chamber transmits fluid pressure to said diaphragm means thereby closing said first means and preventing fluid discharge into the evacuation chamber.

4,136,712

SEALED RESERVOIR FOR BRAKE MASTER CYLINDER

Tomoyuki Nogami, and Kaoru Tsubouchi, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Aug. 9, 1976, Ser. No. 712,862
Claims priority, application Japan, Aug. 14, 1975, 50-98865
Int. Cl.[2] F16K *17/26, 24/00, 37/00*
U.S. Cl. 137—558 **8 Claims**



1. A fluid reservoir adapted for mounting on a brake master cylinder comprising:

a casing having an inner wall and an upper opening for storing an amount of brake fluid;

a resilient seal cap of an elastic material detachably coupled over the upper opening of said casing to air-tightly seal the interior of said casing, said seal cap defining an interior air space with the upper surface of brake fluid in said casing, said cap having at the center thereof a vent hole and an annular boss forming an inner bore opening to the vent hole;

a first annular valve body of elastic material fixedly mounted on said cap concentric with the center of said cap and spaced a predetermined distance radially inwardly from the inner wall of said casing;

a second valve body formed in a mushroom configuration and secured at its neck portion to said annular boss of said cap, said second valve body being made of elastic material and having a circular head portion opposed to said first valve body;

a valve plate having its inner edge carried by said annular boss of said seal cap between said first and second valve bodies, with the outer edge of said plate being spaced radially inwardly from the inner wall of said casing, said valve plate having at least one opening to permit the flow of air therethrough, said valve plate co-operating with said second valve body to provide an inlet check valve permitting the flow of air through said opening in said valve plate into said interior air space and further co-operating with said first valve body to provide an outlet check valve permitting the flow of air out from said interior air space to the exterior; and

means for communicating the interior space to the atmospheric air by way of said inner bore in said annular boss and said inlet and outlet check valves.

4,136,713

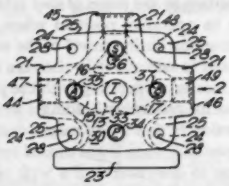
HYDRAULIC CIRCUIT UNITS

Geoffrey Humphreys, London, England, assignor to B & G Hydraulics Limited, Worthing, England

Filed Mar. 29, 1976, Ser. No. 671,497
Claims priority, application United Kingdom, Apr. 1, 1975, 13347/75
Int. Cl.[2] F15C *4/00*
U.S. Cl. 137—561 A **11 Claims**

1. A hydraulic circuit unit comprising a cast generally cubic block having, in a particular orientation thereof, parallel top and bottom faces and four side faces in mutually perpendicular

planes; five mutually parallel passageways comprising bores extending between the top and bottom faces and perpendicular to said faces, said passageways being arranged with four at the corners of a square and the fifth at the intersection of the diagonals of the square; one side face perpendicular to the top and bottom faces and one of the diagonals of the square; means for attaching a valve assembly to said one side face; at least two first connections extending between said one side face and at



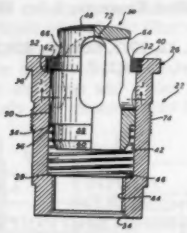
least two of the passageways for connecting a valve assembly when attached to said one side face to said at least two passageways; a pipe opening in each of the three other side faces of the unit; a second connection extending between each pipe opening and the respective adjacent one of said four passageways; and means for connecting said unit to an adjacent similar unit in any one of eight possible relative orientations of the two units so that the passageways of the two units are aligned.

4,136,714

ACCUMULATOR DRAIN CLOSURE

David W. Jones, East Northport, N.Y., assignor to Creavco, Inc., New York, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,552
Int. Cl.² F16L *55/04*
U.S. Cl. 138—30 **23 Claims**



1. A closure device for an accumulator, the accumulator being of the type which stores substances and having an accumulator port through which the substances pass into and out of the accumulator in a predetermined path and a bladder therein for pushing the stored substances through the drain opening, the bladder coming into contact with the opening, said device comprising:

(a) a drain housing defining the accumulator port;

(b) a drain closure member substantially within and movable with respect to said housing, said member having closed and open positions, said member in said closed position closing said accumulator port so as to prevent the bladder from entering said accumulator port;

(c) resilient means within said housing for yieldably urging said member into said open position, said resilient means being so disposed as to be spaced from the predetermined path; and

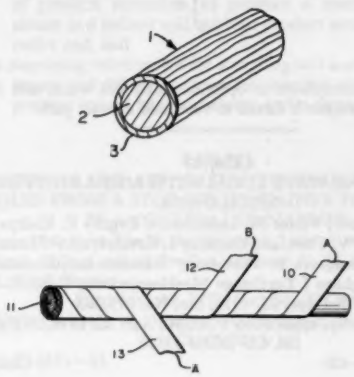
(d) stop means within said housing for retaining said resilient means and said member within said housing accumulator port.

4,136,715

COMPOSITE ARTICLE FROM ORIENTED COPOLYETHEREST ER ELASTOMERS

Charles E. McCormack, Wilmington, Del., and Martin L. Brown, Elkton, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 509,733, Sep. 26, 1974. This application Apr. 28, 1977, Ser. No. 791,941
Int. Cl.² F16L *11/00, 11/04*
U.S. Cl. 138—130 **1 Claim**



1. In a flexible hose of generally thin wall construction, the hose having a core composed of a helical wrapping of thermoplastic elastomeric tape with adjacent turns overlapping, which core is surrounded by a jacket, the improvement wherein the tape which makes up the core is composed of an oriented copolyetherester elastomer that is the reaction product of poly(tetramethylene oxide)glycol having a number average molecular weight of about 975, 1,4-butanediol, and dimethylterephthalate, said elastomer having a Shore D hardness of about 55 and a melting point of about 412° F. encapsulated within a second copolyetherester elastomer of lower melting point that is the reaction product of poly(tetramethylene oxide)glycol having a number average molecular weight of about 975, 1,4-butanediol, dimethylterephthalate and dimethylisophthalate, said elastomer having a Shore D hardness of about 40 and a melting point of about 355° F. and wherein said jacket is composed of a second wrapping of the same elastomeric tape wound helically in the opposite direction from the first, the aforesaid wrappings being brought together through thermal fusion of the contiguous surfaces.

4,136,716

AIR GUIDING COMB TOOTH FOR AIR JET WEAVING LOOM

Shigenori Tanaka, Hachioji; Akio Tojo, Higashi-murayama, and Takao Honya, Koganei, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 10, 1977, Ser. No. 850,383
Claims priority, application Japan, Nov. 12, 1976, 51-135151
Int. Cl.² D03D *47/30*
U.S. Cl. 139—435 **5 Claims**

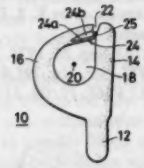
1. An air guiding comb tooth for an air jet weaving loom, comprising:

a body forking into a substantially straight part and an arcuate part which are combined to form an aperture through which a weft yarn is adapted to pass, and to leave an exit slot between said straight part and the leading end of said arcuate part;

a flat spring member extending from an inner surface of said arcuate part toward an inner surface of said straight part so as to substantially close said exit slot; and

screen means for substantially covering the clearance de-

fined between said arcuate part and said flat spring member while permitting said flat spring member to be suffi-



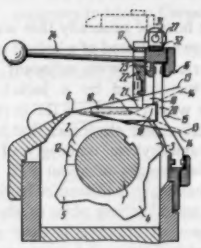
ciently deformable to open said exit slot when said flat spring member is flexed toward said arcuate part.

4,136,717

TRAVELLING-WAVE LOOM WITH LOOM-STOPPING MECHANISM

Jury I. Komarov; Viktor M. Lukhmanov; Evgeny P. Kudryavtsev; Dmitry V. Titov, and Gennady I. Kovalev, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Legkogo I Textilnogo Mashinostroenia, U.S.S.R.

Filed Apr. 22, 1976, Ser. No. 679,233
Claims priority, application U.S.S.R., Apr. 23, 1975, 2129655
Int. Cl.[2] D03D *47/26*
U.S. Cl. 139—436 **5 Claims**



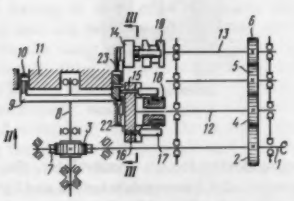
1. In a travelling-wave loom, a rotary reed including a rotary shaft carrying disks each of which are provided with teeth for advancing a weft carrier and for beating up the weft, guide means extending parallel to said rotary reed for guiding a weft carrier advanced by teeth of said disks of said rotary reed, said guide means including a stationary portion and a pivoted portion pivoted to said stationary portion and defining with said stationary portion a channel for receiving part of a weft carrier to guide the latter, said pivoted portion including a plurality of strips situated in line with each other along the path of travel of a weft carrier and said strips each being individually turnable with the pivoted portion of said guide means, releasable holding means operatively connected with the pivoted portion of said guide means for releasably holding the pivoted portion thereof together with said strips in an operative position defining with said stationary portion of said guide means said channel for guiding the weft carriers, said releasable holding means holding said pivoted portion in its operative position with a force which is small enough to permit any one strip and the part of the pivoted portion connected thereto to turn in opposition to the force of said releasable holding means away from its operative position when a weft carrier encounters an obstruction during travel of the weft carrier, and means engaging said strips when the pivoted portion of said guide means is in its operative position for responding to turning of any one of said strips away from its operative position to stop the operation of the loom, said stationary portion of said guide means including a plurality of plates respectively aligned with said disks of said rotary reed and defining between themselves spaces for guiding warp yarns of a shed, and said pivoted portion of said guide means also including a plurality of plates, the latter plates respectively being in line with said disks of said rotary reed and in line with said plates of said stationary portion of said guide means for also defining between themselves spaces for accommodating warp yarns of a shed, said plates of said pivoted portion forming groups of plates which are respectively fixed to said strips and which extend therefrom to define with said plates of said stationary portion said channel for receiving part of a weft carrier to guide the latter, whereby when any one strip turns in opposition to the force of said releasable holding means away from its operative position when a weft carrier encounters an obstruction during travel of the weft carrier, the plates which are fixed to said one strip also turn therewith, said releasable holding means cooperating with the pivoted portion of said guide means for releasably holding a strip and the part of said pivoted portion of said guide means connected thereto in its inoperative position when it has turned toward the latter position in response to obstruction of a weft carrier, so as to indicate visually the location of an obstruction encountered by a weft carrier.

4,136,718

APPARATUS FOR MAKING SERPENTIFORM SPRINGS

Alexei K. Ignatiev, Volgogradsky prospekt, 71, kv. 167; Rusaam S. Nemets, Sirenevy bulvar, 57, kv. 50; Efim S. Gorbulev, Tovarischesky pereulok, 9/11, kv. 5; Elena N. Stolyarova, Varshavskoe shosse, 65, korpus 2, kv. 220, all of Moscow, and Jury M. Kontsov, ulitsa Krasnova, 1, kv. 58, Odessa, all of U.S.S.R.

Filed Dec. 12, 1977, Ser. No. 859,794
Int. Cl.[2] B21F *35/04*
U.S. Cl. 140—105 **2 Claims**

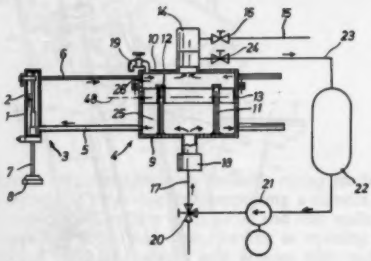


1. An aparatus for making serpentiform springs by bending rod stock, comprising: a cylindrical drum rotatable about its axis: a plurality of pins arranged in a chain at a pre-set spacing over the entire cylindrical surface of said drum and radially relative to the axis of the drum; means for successively bending starting rod stock alternately about said pins, said means including bearing plates rotating in the same direction and having axes of rotation parallel to each other and extending on either side of the bending portion relative to the feed plane of the rod stock at a right angle thereto; bending rods mounted on said plates parallel to their axes of rotation; spring-loaded shoes located on either side of the bending portion transversely of the rod stock being fed, one of said shoes urging the rod stock against the pin about which the bending is effected at a given moment, and another shoe urging the bent stock against the preceding pin; and means for retracting said pins axially into said drum of the portions before and after the bending zone.

4,136,719
METHOD AND DEVICE FOR CLEANING BOTTLE FILLING MACHINES AND THE LIKE

Hermann Kronseder, 8404 Wörth, and Wilhelm Wiess, Hainsacker both of Fed. Rep. of Germany, assignors to Hermann Kronseder, Wörth, Fed. Rep. of Germany

Filed Feb. 3, 1978, Ser. No. 875,262
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2706925; May 28, 1977, 7717057[U]; Aug. 12, 1977, 2736332
Int. Cl.² B65B 3/04; B08B 9/00
U.S. Cl. 141—1 31 Claims



1. Apparatus for filling bottles and other containers with liquid including a common tank for the filling liquid and gas, at least one filler valve having an inlet for filling liquid and an inlet for gas, said inlet for gas being coupled to said tank at a higher level than the inlet for said filling liquid, a float arranged for vertical movement in said tank,

improved means for cleaning said apparatus by circulating cleaning fluid through it in the absence of said filling liquid and gas, comprising:

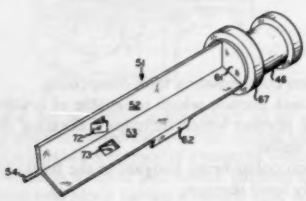
means for limiting the movement of said float in one direction to a position for said float to partition said tank into upper and lower chambers and for said gas inlet to said filler valve to communicate with said upper chamber and said filling liquid inlet of said filler valve to communicate with said lower chamber,

inlet means for introducing pressurized cleaning fluid into one of said chambers and outlet means for exhausting simultaneously said cleaning fluid from the other of said chambers.

4,136,720
PRODUCTION OF A MARBLED PRODUCT

Alfred W. Kinney, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 8, 1976, Ser. No. 664,771
Int. Cl.² B65B 3/04
U.S. Cl. 141—9 26 Claims



1. Apparatus comprising:

a plurality of supply conduit means adapted to supply a plurality of product constituent streams of similar viscosity and temperature;

product patterning means having a plurality of inlet means and an outlet end, each said inlet means being operably connected to a respective one of said plurality of supply conduit means, said product patterning means being adapted for accepting a constituent streamlet of product from each of said supply conduit means and for providing a pattern of juxtaposed adjacent product streamlets;

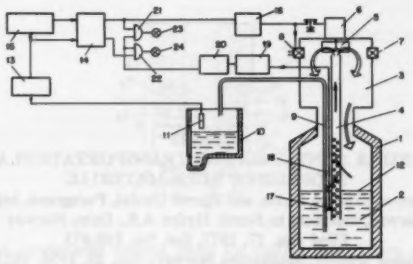
product marbling means between said inlet means and said outlet end for mixing a limited portion of at least one product constituent within said pattern of product streamlets with an adjacent product streamlet within said pattern of product streamlets to produce a marbled product stream and deliver said marbled product stream from said outlet end; and

a dispensing valve means for accepting said marbled product stream and delivering separated segments of said marbled product stream from a delivery outlet thereof.

4,136,721
METHOD AND APPARATUS FOR TRANSFERRING LIQUID FROM A STORAGE CONTAINER TO A VESSEL IN A CONTROLLED MANNER

Göran Holmqvist, älvsjö; Bo Molander, Lidingö, and Jan Wicklund, Spånga, all of Sweden, assignor to AGA Aktiebolag, Lidingö, Sweden

Filed May 19, 1977, Ser. No. 798,494
Claims priority, application Sweden, Jun. 1, 1976, 7606120
Int. Cl.² B65B 3/10
U.S. Cl. 141—11 12 Claims



1. A method of transferring a liquid from a first vessel to a second vessel communicating with said first vessel at a level beneath the surface of the liquid contained therein, comprising the steps of passing cold vapour from the surface of the liquid in said first vessel, through a passage whose cross-sectional area is smaller than the cross-sectional area of said liquid surface, to a heating zone; heating said vapour in said zone to a temperature above the boiling point of the liquid in said first vessel; forcibly passing the thus heated vapor by a positively driven circulating device back to said first vessel separately from the flow of cold vapor such that vapor is circulated in a closed path between said first vessel and said heating zone, and circulating thus heated vapour above the surface of said liquid to increase the pressure above said surface; and utilizing said increased pressure to force liquid from said first vessel to said second vessel.

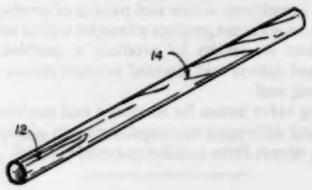
4,136,722
METHOD OF MAKING IMPACT DELIVERY IN STRIKING MEMBERS FROM COMPRESSED WOOD VENEERS

Charles F. Travis, P.O. Box 1285, Greenville, S.C. 29602

Division of Ser. No. 696,687, Jun. 16, 1976. This application Feb. 9, 1977, Ser. No. 767,161
Int. Cl.² A63B 53/04; B29J 5/00; B27D 1/08
U.S. Cl. 144—317 4 Claims

1. A method of making an impact delivery member comprising the steps of stacking a multiplicity of main full length wood veneers and another multiplicity of comparatively short partial

length supplemental wood veneers in superposed relationship and with said main and supplemental veneers in alternating relationship in said stack and with the supplemental veneers arranged at one comparatively short end region only of said stack and with a bonding agent applied to opposing faces of the main and supplemental veneers in said stack, and then compressing all of the veneers in said stack in a direction substantially normal to said opposing faces with a sufficient degree of compression to produce a permanently laminated elongated body of substantially uniform thickness throughout its length with the density of said comparatively short end region substantially increased in said elongated body compared to the density of the remainder of said body.

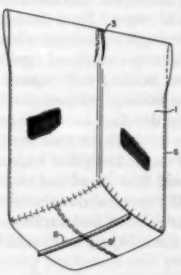


4,136,723

FLEXIBLE CONTAINER FOR TRANSPORTATION AND STORAGE OF BULK MATERIAL

Johannes Skaadel, Skien, and Bjarne Omdal, Porsgrunn, both of Norway, assignors to Norsk Hydro A.S., Oslo, Norway

Filed Jun. 27, 1977, Ser. No. 810,473
Claims priority, application Norway, Jun. 28, 1976, 762230
Int. Cl.[2] B65D *29/00*
U.S. Cl. 150—1 **5 Claims**



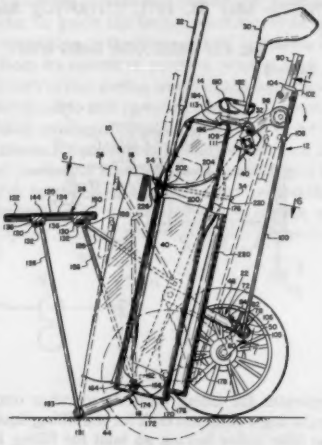
1. A flexible container for transportation and storage of bulk material, said container comprising:
a single piece of material having an upper section, side walls and a bottom section;
said upper section having lifting loops and a central filling opening;
said bottom section comprising at least four separate flaps which each have free lateral edges and which are direct extensions of said side walls; and
said flaps having lower edges which are joined together in pairs to form joints that cross at a single point.

4,136,724

GOLF CLUB CARRIER

Ammon M. Leitzel, Portland, Oreg., assignor to Jarman Company, Milwaukie, Oreg.

Filed Jan. 21, 1977, Ser. No. 760,912
Int. Cl.[2] A63B *55/00*
U.S. Cl. 150—1.5 **9 Claims**



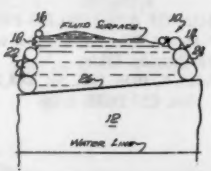
1. In a golf club container,
a hollow container having a front wall provided with an opening through which club heads can be inserted,
and separating means for separating the clubheads from each other.

4,136,725

MOTION COMPENSATING LIQUID HOLDING TANK

Lawrence M. Phillips, Olivenhain, and Homer O. Porter, Del Mar, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1977, Ser. No. 753,140
Int. Cl.[2] B63C *9/16*
U.S. Cl. 150—0.5 **8 Claims**

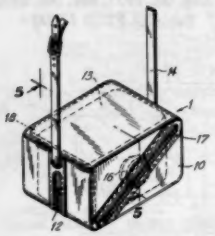


1. A motion compensating tank comprising:
a bottom tank portion which is capable of holding a liquid;
a top tank portion which includes a flotation collar and a flexible collar;
the flotation collar being buoyant in the liquid to float substantially level thereon;
the flexible collar being an accordian flap which sealably joins the flotation collar to the bottom tank portion; and
the flaps of the flexible collar being substantially parallel to the plane of the flotation collar,
whereby sloshing liquid in the tank can be retained by movements of the flotation collar and corresponding expansions and contractions of various sides of the accordian flap.

4,136,726
CAMERA CASE WITH INTEGRAL EXTENDABLE POUCH

Robert M. Lee, 16 East 53rd St., Woodmere, N.Y. 10022

Filed Feb. 7, 1978, Ser. No. 876,035
Int. Cl.² G03B 29/00
U.S. Cl. 150—52 J 9 Claims

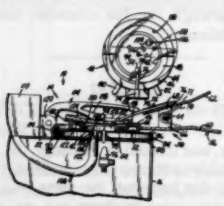


1. A camera case comprising an openable casing having an interior adapted for receiving and supporting a camera, said casing having top and bottom walls, front and rear walls, and left and right side walls, said casing having an opening with fastener means extending across said bottom wall and upwardly along both side walls, said opening being proportioned to permit a camera to be inserted therethrough into the casing, strap means on said camera for suspension of the camera, said casing having hole means in one of said side walls such that said strap means can extend from said hole means and from said opening for the suspension of the camera and the casing thereon, said casing including a flexible pouch having a first retracted position within the interior of the casing and a second projecting position in which the pouch is folded inside-out and extends from the casing to form an extension thereof in which the interior of the casing is in communication with the interior of the pouch such that an extension on the camera lens can be accommodated within said pouch in extended position and be entirely covered thereby, said front wall of the casing being provided with an opening through which said pouch extends in the projecting position.

4,136,727
OPTICAL LENS BLOCKING METHOD AND APPARATUS

Albert B. Vogt, 506 Fifth St. South, Sauk Rapids, Minn. 56379

Filed Jul. 8, 1977, Ser. No. 814,028
Int. Cl.² B22D 17/24; B29D 11/00
U.S. Cl. 164—112 20 Claims



1. Apparatus for mounting a lens block to an optical lens blank having predetermined independent optical and mechanical centers, the lens block formed of a material which is applied to the lens blank as a liquid and which hardens to form the block, the hardened block having a central axis, comprising:

(a) a base;

(b) a lens blank holder removably mounted to said base and having a central axis corresponding to the central axis of the formed lens block whereby the lens blank can be mounted on said holder with the optical axis thereof aligned with said central axis;

(c) a plate member affixed to said base and having a substantially planar surface on which said holder can be removably placed; said plate member, said holder, and the lens blank defining an enclosed chamber into which the lens block material in a liquid state is introduced;

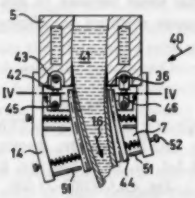
(d) means on said plate member for forming on the lens block means for holding the lens block in subsequent grinding of the lens blank, said forming means spaced apart and aligned on said plate member whereby said holder can be placed on said plate member with a line drawn through the mechanical center of the lens blank aligned with said forming means;

(e) whereby the blocked lens blank has its optical center aligned with the central axis of the lens block and its mechanical center on a line drawn through said holding means on the hardened lens block.

4,136,728
CONTINUOUS STEEL CASTING MOLD FOR BILLETS AND BLOOMS

Markus Schmid, Zürich, Switzerland, assignor to Concast AG, Zürich, Switzerland

Filed Dec. 15, 1977, Ser. No. 860,785
Claims priority, application Switzerland, Dec. 30, 1976, 16462/76
Int. Cl.² B22D 11/124
U.S. Cl. 164—444 5 Claims



1. A continuous casting mold for casting steel billets and blooms having cornered cross-sectional configuration, especially four-cornered cross-sections, comprising:

an upper mold part having mold walls;

a lower mold part having mold walls;

said mold walls of said upper mold part and said lower mold part enclosing a mold compartment in which there is continuously cast a strand;

said mold walls of said lower mold part being movable independently of one another;

pivot elements connected with each of the independently movable walls of the lower mold part for enabling such walls to move about pivot axes defined by said pivot elements which are arranged transversely with respect to the direction of travel of the strand;

means for operatively connecting said pivot elements with said upper mold part;

resilient means for applying the independently movable walls of the lower mold part in the direction of the hollow mold compartment;

means movably arranging the pivot elements connected with each independently movable wall of the lower mold part for movement in a direction transverse to the side of the related wall of the lower mold part which confronts the hollow mold compartment; and

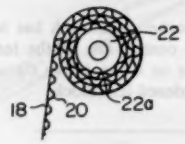
said pivot elements mounted to be movable incorporate means enabling an additional pivotal movement of the related wall within a predetermined extent about an axis extending approximately parallel to the direction of travel of the strand.

4,136,729

HEAT ACCUMULATING MEMBER FOR A ROTARY HEAT-ACCUMULATION TYPE HEAT EXCHANGER OF A GAS TURBINE ENGINE

Yoshihiro Sakaki, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Japan

Continuation-in-part of Ser. No. 673,479, Apr. 5, 1976, abandoned. This application Jan. 17, 1978, Ser. No. 870,110
Int. Cl.[2] F28D *19/04*
U.S. Cl. 165—9 **3 Claims**



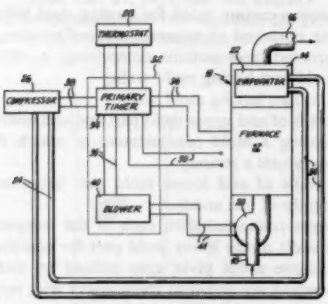
1. In a heat accumulating member for rotary heat-accumulation type heat exchanger of a gas turbine engine, the improvement comprising a hub rotatably mounted on a shaft of the heat exchanger; a flat sheet of metal; and a corrugated sheet of metal attached to said flat sheet into an integral unit which is wound around said hub; at least a portion of said flat sheet near the high temperature side having a thickness of about 2.5 times that of said corrugated sheet for eliminating deformation of said heat accumulating member due to softening effect of a material of said flat sheet because of gas pressure and high temperature of gasses without sacrificing engine operating efficiency.

4,136,730

HEATING AND COOLING EFFICIENCY CONTROL

Bernard B. Kinsey, 102 Skyline Dr., Austin, Tex. 78746

Filed Jul. 19, 1977, Ser. No. 817,100
Int. Cl.[2] F28D *21/00*
U.S. Cl. 165—12 **10 Claims**



1. A method of operating apparatus for changing the temperature of air in an enclosure and including a thermostat responsive to the temperature of said air, a heat exchanger, a blower for blowing said air through said heat exchanger and means controlled by said thermostat for producing a temperature differential in said heat exchanger, said method comprising the steps of:

causing said thermostat to initiate operation of said means and said blower;

limiting the maximum time of operation of said means to a first predetermined time period and to terminate operation of said means even when said thermostat would normally cause said operation to continue; and

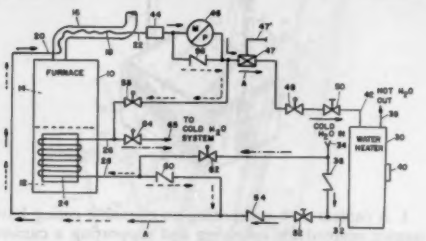
causing said blower to continue to blow air through said heat exchanger for only a second predetermined time period after termination of operation of said means.

4,136,731

HEAT TRANSFER APPARATUS

Richard J. DeBoer, 4054 Baumhoff, NW., Comstock Park, Mich. 49321

Filed Aug. 26, 1977, Ser. No. 827,900
Int. Cl.[2] F27D *17/00*
U.S. Cl. 165—12 **11 Claims**



1. Heat transfer apparatus comprising:

a flue heat exchanger adapted to be positioned in a chimney flue;

conduit means for coupling said heat exchanger to a hot water heater;

thermally responsive switch means associated with the hot water heater;

pump means coupled to said heat exchanger and to said conduit means for forcing fluid from said heat exchanger into the hot water heater; and

timing circuit means coupled to said switch means and to said pump means for activating said pump for a predetermined period of time sufficient to transfer heated water from said heat exchanger to the water heater.

3. Heat transfer apparatus comprising:

a first heat exchanger for positioning in the flue of a furnace;

a second heat exchanger for positioning in the fan chamber of the furnace;

first means for coupling said first heat exchanger in a first fluid circulation loop with a water heater;

second means for coupling said first and second heat exchangers together in a second fluid circulation loop;

valve means for selectively permitting fluid flow in said first or second loops during a heating mode of operation; and

third means for selectively coupling said second heat exchanger to a source of cold water for providing cooling to air flowing through the fan chamber during a cooling mode of operation.

4,136,732

METHOD AND APPARATUS FOR CONTROLLING AIR-CONDITIONING SYSTEMS

Merlin E. Demaray, and Russell G. Attridge, Jr., both of Columbus, Ohio, assignors to Ranco Incorporated, Columbus, Ohio

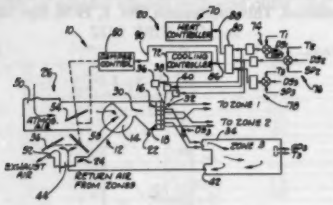
Division of Ser. No. 661,619, Feb. 26, 1976, Pat. No. 4,042,013. This application Apr. 19, 1977, Ser. No. 788,834
Int. Cl.[2] F25B *29/00*
U.S. Cl. 165—16 **3 Claims**

1. In an air conditioning system wherein heating and cooling means are employed to alter air temperature in a zone and a temperature responsive control system governs operation of the heating and cooling means, the zone temperature control system comprising:

(a) sensor means for sensing zone air temperature conditions;

(b) command signal generator means connected to said sensor means for producing a command signal which is variable throughout first and second value ranges as a function of sensed temperature conditions;

(c) controller means connected to said signal generator means for effecting operation of the heating and cooling means, said controller means responsive to command signal values in said first range to control operation of one of said heating and cooling means and responsive to command signal values in said second range to control the other of said heating and cooling means; and,



(d) command signal modifier means rendered effective between said first and second command signal value ranges to substantially prevent said command signal from changing value in response to changes in sensed zone temperature conditions between first and second predetermined temperature condition levels, said controller means maintained ineffective to operate either said heating means or said cooling means when zone temperature condition levels are between said first and second levels.

4,136,733

HEATING DEVICE

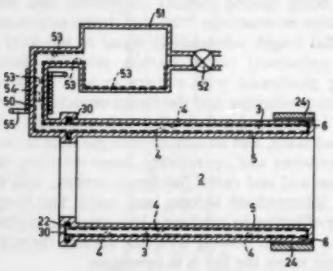
George A. A. Asselman, Eindhoven, Netherlands; David B. Green, Weymouth, England; Adrianus P. J. Castelijns, Eindhoven, Netherlands; Pieter A. Naastepad, Eindhoven, Netherlands, and Jacob W. de Ruiter, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 613,271, Sep. 15, 1975, abandoned, which is a division of Ser. No. 354,498, Apr. 25, 1973, Pat. No. 3,965,334. This application Jan. 20, 1978, Ser. No. 871,014

Claims priority, application Netherlands, May 4, 1972, 7206063

Int. Cl.[2] F28D *15/00*; H05B *3/62*

U.S. Cl. 165—32 **8 Claims**



1. An isothermal heating apparatus which comprises a plurality of separate heat ducts arranged substantially parallel to each other about a longitudinal axis substantially parallel to said heat ducts, said plurality of heat ducts together defining a centrally disposed heating chamber, at least one end of each such heat duct being closed, means interconnecting the separate heat ducts with each other, a vaporizable and condensible heat-transport medium in said heat ducts, means arranged externally of a portion of said heat ducts to vaporize said heat-transport medium, the resulting vaporized heat-transport medium flowing through said heat ducts wherein it condenses and provides heat for transmittal into the centrally disposed heating chamber, a gas buffer reservoir containing an inert control gas, and a separate duct connecting said interconnecting means with said gas buffer reservoir and having a heat-transmitting wall, said inert control gas during operation forming an interface with the vaporized heat-transport medium at the heat-transmitting wall of said separate duct and exposing said heat-transmitting wall more or less when the vaporized heat-transport medium pressure is higher or lower, respectively, than such pressure corresponding to the normal operating temperature of the heating chamber.

4,136,734

FEEDWATER HEATER

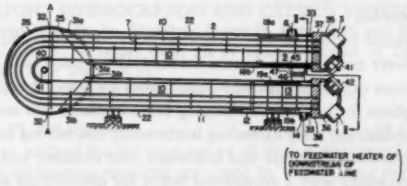
Takuya Sasaki; Tamotsu Yamane; Yoshun Horibe, and Mituo Suzuki, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1976, Ser. No. 694,156

Claims priority, application Japan, Jul. 5, 1975, 50-82974

Int. Cl.[2] F28B *1/02*; F28F *9/26*; F28D *7/06*

U.S. Cl. 165—111 **6 Claims**



1. A feedwater heater comprising:

a plurality of heating tubes arranged in U form for passage of feedwater therethrough;

a feedwater inlet chamber having a feedwater inlet for introducing feedwater thereinto and a tube plate being formed with the inlet chamber in one united body securing one of the ends of said heating tubes collectively in position and also having formed therein a feedwater reservoir;

a feedwater outlet chamber having a feedwater outlet for discharging the heated feedwater and a tube plate being formed with the outlet chamber in one united body securing the other ends of said heating tubes collectively in position and also having formed therein a feedwater reservoir;

a first cylindrical body housing therein the nest of one-side portions of said U-formed heating tubes and having support plates for holding said heating tubes in place, said cylindrical body having its one end connected into said feedwater outlet chamber and also provided with a hot steam inlet for introducing hot steam which acts as a feedwater heating source;

a second cylindrical body housing therein the nest of the other side portions of said U-formed heating tubes and having support plates for holding said heating tubes in place, said second cylindrical body having its one end connected into said feedwater inlet chamber and also provided with a condensate outlet for discharging steam condensate to the outside of the system;

a spherical container having formed therein a space for housing the bent portions of said U-formed heating tubes, said spherical container being constituted from two hemispherical shells, one of which is joined to said both cylindrical bodies:

said spherical container being provided with a condensate inlet means for introducing thereinto as additional heat source the condensate from another feedwater heater unit located upstream of the feedwater system.

2. A feedwater heater comprising:

a plurality of generally horizontal heating tubes arranged in U form for passage of feedwater therethrough;

a feedwater inlet chamber having a feedwater inlet for introducing feedwater thereinto and a tube plate being formed as one integral piece with the inlet chamber in one united body securing one of the ends of said heating tubes collec-

tively in position and also having formed therein a feedwater reservoir;

a feedwater outlet chamber structurally independent of and spaced from said inlet chamber and having a feedwater outlet for discharging the heated feedwater and a tube plate being formed as one integral piece with the outlet chamber in one united body securing the other ends of said heating tubes collectively in position and also having formed therein a feedwater reservoir;

a first horizontal axis cylindrical body housing therein the nest of one-side portions of said U-formed heating tubes and having support plates for holding said heating tubes in place, said cylindrical body extending horizontally and having its one end connected into said feedwater outlet chamber and also provided with a hot steam inlet for introducing hot steam which acts as a feedwater heating source;

a second horizontal axis cylindrical body parallel to said first body and housing therein the nest of the other side portions of said U-formed heating tubes and having support plates for holding said heating tubes in place, said second cylindrical body extending horizontally and having its one end connected into said feedwater inlet chamber and also provided with a condensate outlet for discharging steam condensate to the outside of the system;

a spherical container having formed therein a space for housing the bent portions of said U-formed heating tubes, said spherical container being constituted from two hemispherical shell elements;

a first one of said hemispherical shell elements being connected to the end of each of said cylindrical bodies opposite from said inlet and outlet chambers to hold said cylindrical bodies in spaced side by side relationship, and having its circular periphery in a generally vertical plane;

the second one of said hemispherical shell elements being unconnected to said cylindrical bodies and said tubes, and having its circular periphery connected to the periphery of said first hemispherical shell so as to be removable for repair and replacement access to said tube bent portions;

means having plate members disposed one above the heating tube nest positioned within said first cylindrical body on the hot steam inlet side and the other below said tube nest so that said plate members are connected to the first cylindrical body and extend along a length of said tube nest, and forming a desuper heating zone to give heat of said hot steam to feedwater in said heating tubes in a part of said first cylindrical body within the range of said plate members.

means having similar plate members also disposed one below the heating tube nest positioned within said second cylindrical body on the condensate outlet side and the other above said tube nest so that said similar plate members are connected to the second cylindrical body and extend along a length of said tube nest, and forming a drain subcooling zone to give heat of the condensate to feedwater in said heating tubes in a part of said second cylindrical body within the range of said plate members; and

means having a condensing zone to give latent heat developed at the time of condensation of steam to feedwater in said heating tubes in the part of the first cylindrical body not including said desuper heating zone, the part of the second cylindrical body not including said drain subcooling zone and said spherical container.

4,136,735

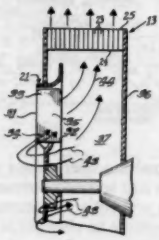
HEAT EXCHANGE APPARATUS INCLUDING A TOROIDAL-TYPE RADIATOR

Harold D. Beck, Downers Grove, and C. Paul Kolthoff, Jr., Naperville, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Continuation-in-part of Ser. No. 543,713, Jan. 24, 1975, abandoned, which is a continuation of Ser. No. 472,257, May 22, 1974, abandoned. This application Oct. 1, 1976, Ser. No. 728,657

Int. Cl.[2] F28F *9/22*

U.S. Cl. 165—125 **40 Claims**



1. A heat exchange apparatus comprising:

a heat exchanger means including a toroidal radiator structure, said toroidal radiator structure including a toroidal radiator core having a plurality of radially extending cooling air passageways formed therethrough, said toroidal radiator structure further including a first radially extending wall and a second radially extending wall axially spaced and substantially parallel with respect to said first wall, said first and second walls substantially defining the axial limits of said toroidal radiator core and an air-receiving plenum chamber disposed radially inwardly of said toroidal radiator core;

a rotatable, axial flow fan having a plurality of circumferentially spaced, radially extending impeller blades; and

a generally annular fan shroud means supported within an opening formed through said first wall and encircling the fan, said fan shroud means including a generally cylindrical, axially extending throat section, an annular, generally radially extending flat flange section, said flat flange section being spaced radially outwardly and axially in a direction downstream from said throat section and having a radial length substantially equal to the axial length of said cylindrical throat section, said fan shroud means being positioned with respect to said toroidal radiator structure whereby said flat flange section lies substantially in a plane spaced and parallel with respect to said first and second walls, and an annular intermediate section extending between and operatively interconnecting said throat section and said radial flat flange section, said throat section, intermediate section, and radial flat flange section being effective to produce a low pressure region between the air stream flowing over the surface thereof and such surface when the fan is in operation.

4,136,736

BAFFLE

William M. Small, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 681,670, Apr. 29, 1976, abandoned. This application Aug. 20, 1976, Ser. No. 715,704

Int. Cl.[2] F28F *7/00*

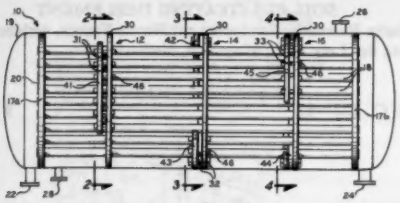
U.S. Cl. 165—162 **23 Claims**

1. Supporting apparatus for a plurality of tubes in the form of a tube bundle suitable for use in a shell and tube heat exchanger, said tubes positioned to form at least a first plurality of parallel tube rows and a second plurality of parallel tube rows and spaces between at least a portion of the adjacent tube rows comprising:

at least one baffle set providing radial support for each tube and comprising at least three baffles, wherein each baffle comprises

an outer ring surrounding said tube bundle; and

a plurality of rods positioned in a portion of the spaces between adjacent tube rows in one plurality of parallel tube rows and cooperating with said outer ring to form a plurality of parallel chords with said outer ring, each said



rod being of sufficient size to provide support for the tubes in the tube rows adjacent said rod, and the number of rods in each of said baffles being substantially less than the total number of rods necessary for positioning one rod in each of the spaces between all of the tube rows in the plurality of parallel tube rows and, wherein each of said baffles is positioned substantially parallel to the other baffles in the apparatus.

4,136,737

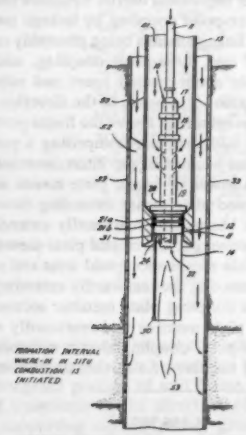
METHOD FOR AUTOMATICALLY INITIATING IN SITU COMBUSTION FOR ENHANCED THERMAL RECOVERY OF HYDROCARBONS FROM A WELL

Curtis E. Howard, Humble; Douglas G. Calvin, and Robert W. Pitts, Jr., both of Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 669,127, Mar. 22, 1976, Pat. No. 4,079,784. This application Sep. 28, 1977, Ser. No. 837,053

Int. Cl.[2] E21B *43/24*

U.S. Cl. 166—251 **7 Claims**



6. A method for initiating heat in a well in a subterranean reservoir for recovering petroleum from the well comprising,

(a) positioning an elongated open ended combustion chamber in the well at the depth of the subterranean reservoir,

(b) injecting fuel and air from fuel and air supply conduits, respectively, into the combustion chamber for forming an air-fuel mixture in the combustion chamber,

(c) mounting an ignitor adjacent to a means in the combustion chamber,

(d) lighting the air-fuel mixture in the combustion chamber with the ignitor means responsive to a thermocouple detecting no burning in the combustion chamber,

(e) extinguishing the ignitor responsive to the thermocouple detecting burning in the combustion chamber to provide an automatic, reliable, and flame-out proof method for initiating heat deep in the well, and

(f) supplying air to the combustion chamber by passing the air through a plurality of transverse air ducts extending transversely through the air supply duct walls for passing from a passage externally of the air supply duct to internally of the air supply duct for ensuring a highly agitated combustible mixture.

4,136,738

ENHANCED RECOVERY OF OIL FROM A DIPPING SUBTERRANEAN OIL-BEARING RESERVOIR USING LIGHT HYDROCARBON AND CARBON DIOXIDE

Stewart Haynes, Jr., Houston; Frank H. Lim, Katy, and Robert B. Alston, Missouri City, all of Tex., assignors to Texaco, Inc., New York, N.Y.

Filed Aug. 24, 1977, Ser. No. 827,413

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—273 **15 Claims**

1. A method for the recovery of oil from a dipping subterranean oil-bearing reservoir traversed by at least one injection well and one production well said oil being immiscible with carbon dioxide at the reservoir conditions of temperature and pressure, comprising the steps of:

(a) injecting via said injection well a first slug of light hydrocarbon at a rate exceeding the critical velocity and in amounts sufficient to form a mixture of altered fluid of reservoir oil and light hydrocarbon adjacent said injection well, said mixture being conditionally miscible with carbon dioxide at the reservoir conditions of temperature and pressure,

(b) injecting via said injection well a second slug comprising carbon dioxide at a rate less than the critical velocity and in amounts sufficient to form a transition zone of conditional miscibility between said mixture and said carbon dioxide slug,

(c) injecting via said injection well a drive agent to displace said altered fluid and second slug and reservoir oil through said reservoir toward said production well,

(d) producing said reservoir oil via said production well.

4,136,739

METHOD FOR GENERATING HYDROFLUORIC ACID IN A SUBTERRANEAN FORMATION

William M. Salathiel, and Christopher M. Shaughnessy, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Aug. 19, 1977, Ser. No. 826,206

Int. Cl.[2] E21B *43/27*

U.S. Cl. 166—300 **37 Claims**

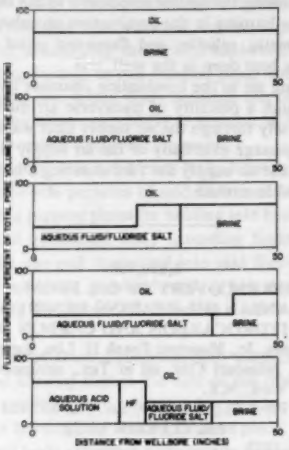
37. In a method for acidizing a subterranean siliceous formation surrounding a wellbore wherein at least two aqueous solutions are injected into the formation, one of the aqueous solutions containing a fluoride salt and the other aqueous solution containing an acid, the improvement comprising the steps of

(a) injecting into the formation one of said aqueous solutions,

(b) injecting into the formation a substantial volume of liquid that is substantially immiscible with said injected aqueous solution to reduce the saturation of the injected aqueous solution in a portion of the formation invaded by said aqueous solution in step (a) to approximately residual saturation.

(c) injecting into the formation the other aqueous solution,

said acid in one of said aqueous solutions combining with fluoride salts in the other aqueous solution to form hydrofluoric acid which is capable of dissolving siliceous material.

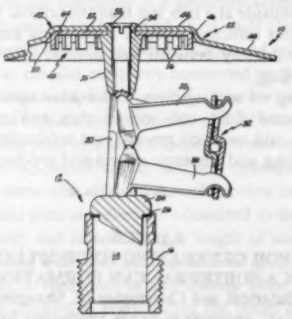


4,136,740

LARGE DROP SPRINKLER HEAD FOR HIGH HEAT OUTPUT FIRES

Richard T. Groos, and Gerald W. Sanders, both of Hastings, Mich., assignors to The Viking Corporation, Hastings, Mich.

Filed Jun. 23, 1977, Ser. No. 809,169
Int. Cl.² A62C *37/10*; B05B *1/26*
U.S. Cl. 169—39 **14 Claims**



1. An improved upright sprinkler head of the automatic type including a nozzle, a pair of arms extending outwardly and upwardly from said nozzle and being joined at their ends by a member positioned opposite and aligned with said nozzle, said improvement comprising:

a concave plate distributor defining a cup-shaped central portion opening towards said nozzle, said cup-shaped central portion including a circular, generally planar base secured at its center to said member and a generally cylindrical wall extending around the periphery of said base towards said nozzle, said plate distributor further including a radially, outwardly and downwardly extending annular flange having a generally concave shape and being joined to the periphery of said cylindrical wall to define a shoulder, the outer peripheral edge of said flange being in a single plane; and

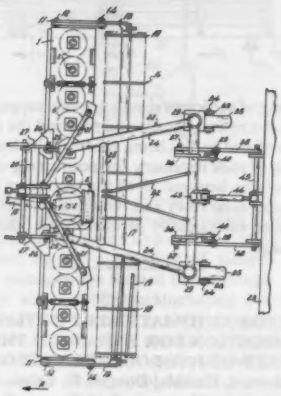
large drop deflector means carried by said plate distributor and positioned within said cup-shaped central portion for generating large drops of liquid, said large drop deflector means being generally cylindrical and including a plurality of tines, said tines being equally spaced around the periphery of said deflector means and extending towards said nozzle beyond said shoulder and generally perpendicular to said base.

4,136,741

SOIL CULTIVATING IMPLEMENT

Celestin Rambach, Vendeuvre sur Barse, France, assignor to C. van der Lely N.V., Maasland, Netherlands

Filed Dec. 3, 1976, Ser. No. 747,180
Int. Cl.² A01B *33/16, 59/043*
U.S. Cl. 172—47 **9 Claims**



1. A soil cultivating implement comprising an elongated transverse frame portion and soil working means supported on said frame portion, a fixed three-point front coupling adjacent the forward side of said frame portion being connectable to a prime mover, a further implement carrier structure being interconnected to said three-point coupling by linkage means, forward portions of said linkage means being pivotably connected to the lower part of said three-point coupling, said linkage means being pivotable about spaced apart and substantially horizontal axes that extend transverse to the direction of travel and said linkage means extending above the frame portion from the carrier structure, said structure comprising a pair of substantially vertical frame beams that are interconnected with an upper tie beam and a lower tie beam, plate means secured to said upper tie beam, said plate means extending downwardly, below said lower tie beams and rearwardly extending arms being pivoted to the lower portion of said plate means, bracket means fixed to said plate means above said arms and adjustable carrier arms interconnecting the rearwardly extending arms to said bracket means, a coupling plate member secured to said upper tie beam, said plate member and rearwardly extending arms forming a three-point coupling that is connectable to a cooperating coupling member of a further implement.

4,136,742

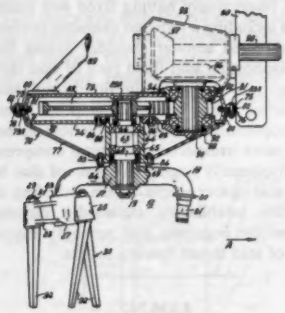
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Aug. 23, 1976, Ser. No. 716,766
Claims priority, application Netherlands, Aug. 25, 1975, 7509994
Int. Cl.² A01B *33/06*
U.S. Cl. 172—59 **8 Claims**

1. A soil cultivating implement comprising an elongated frame portion and a transverse row of rotatable soil working members being mounted on said frame portion, each soil working member having an upwardly extending shaft that defines a

corresponding axis of rotation for that member and driving means engaging said shaft, said driving means comprising a gear connection for the shaft and said connection being supported by a respective bearing housing, said frame comprising an assembly of three spaced apart plates located above one another, said plates defining the walls of an upper chamber and



a lower trough, said gear connection being positioned within said chamber, at least in part, and said housing together with bearings being located within said trough, said housing being releaseably secured in openings of the lower two plates, said member together with corresponding shaft, housing and bearings being installable into and removable from said trough.

4,136,743

SOIL CULTIVATING IMPLEMENT

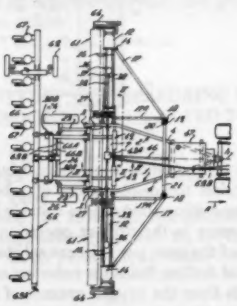
Ary van der Lely, Weverskade 10, Maasland, Netherlands

Filed Jan. 6, 1977, Ser. No. 757,159

Claims priority, application Netherlands, Jan. 8, 1976, 7600141

Int. Cl.² A01B *33/06*

U.S. Cl. 172—59 **8 Claims**



1. A soil cultivating implement comprising a main frame and a first group of soil working members being journalled in a central elongated portion of said frame, said central portion extending transverse to the direction of travel, outer frame portions supporting corresponding groups of soil working members being linked at the lateral sides of said central portion, at least one outer frame portion being elongated and extending transverse to the direction of travel, driving means engaging the soil working members to rotate same during operation, said outer frame portion being linked to the central portion by at least one pivot connection and also interconnected to said central portion by a respective adjusting cylinder assembly, said cylinder assembly being interconnected to said outer portion with a connection including pin means, said pin means being held by lug means and said pin means being displaceable within limits defined by said lug means, said outer portion being independently movable with respect to said central portion, to match ground undulations during travel, latching means releasably connecting said outer portion to said central portion, said latching means being positioned to automatically engage retaining means and secure the outer portion in an upwardly extending transport position, said latching means, at least in part, being interconnected to the cylinder of said assembly.

4,136,744

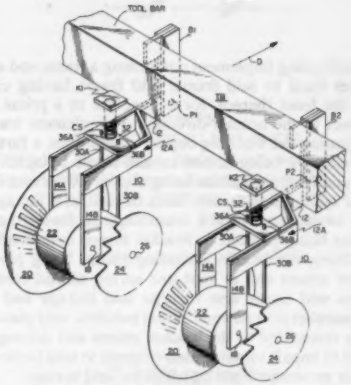
GROUND DRIVEN POWER TILLAGE DEVICE

Daniel E. Hammett, Nicholasville, and Edward M. Smith, Lexington, both of Ky., assignors to The University of Kentucky Research Foundation, Lexington, Ky.

Filed Jul. 12, 1977, Ser. No. 815,219

Int. Cl.² A01B *33/02, 33/08*

U.S. Cl. 172—60 **23 Claims**



14. A gang tillage device for towing from a host machine with individual, passive prime movers for each tillage means therein comprising:

a tool bar;

bracket means on said tool bar having pivot connections beneath said tool bar;

a plurality of power tillage modules each having a dray bar with a free end and a coupling end, the coupling end being attached to a corresponding said pivot means on said bracket means;

each said power tillage module further comprising:

a rotary coulter suspended beneath the free end of said dray bar for engagement with a ground surface to be tilled and rotatable by said ground engagement in response to translation of said dray bar;

a power shaft rotatable by said coulter;

a torque transfer means having an input drive means engaged with and driven by said power shaft in response to rotation of said coulter and an output shaft means substantially parallel with and radially spaced from said power shaft and driven by said input drive means in opposite rotation to said power shaft;

a rotary tillage blade mounted on said output shaft means for rotation therewith for engagement with a partial entry to a predetermined tilling depth into the surface of the ground to be tilled;

said torque transfer means including a housing; and

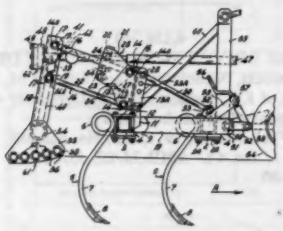
ground engaging depth limiting means mounted on said housing adjacent said tilling blade for maintaining said predetermined tilling depth of said tilling blade; and

said tillage device further including bias means mounted on said tool bar and acting against said free end of said dray bar to bias said coulter toward said ground surface.

4,136,745
SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Dec. 27, 1976, Ser. No. 754,228
Claims priority, application Netherlands, Dec. 31, 1975, 7515219
Int. Cl.² A01B 39/10
U.S. Cl. 172—63 34 Claims

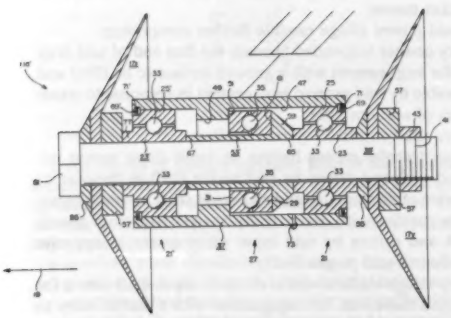


12. A cultivating implement comprising a frame and a plurality of tines fixed to said frame, said frame having coupling means at the front thereof, for connection to a prime mover, with respect to the normal direction of implement travel and means adjusting the working depths of said tines, a further soil working member being linked to said frame by spaced apart linkages, said further member being supported by said frame at the rear of said tines to further work the soil, said linkages each including an upper arm and a lower arm, the forward portions of the arms being pivoted to bracket means connected to the frame, a fixing mechansim including plates, being pivoted to the bracket means and at least one spring of said mechanism bearing on said upper arm to urge said linkage and further working member into an equilibrium position, said plates being adjustably connected to the bracket means and driving means connected to impart vibratory movements to said further member, which movements are opposed by said spring.

4,136,746
BEARING ASSEMBLY FOR FARM IMPLEMENTS INCORPORATING ROTATABLE DISCS

Arthur P. Tusing, P.O. Box 64, Dell, Ark. 72426

Filed May 23, 1977, Ser. No. 799,446
Int. Cl.² A01B 71/04
U.S. Cl. 172—599 6 Claims

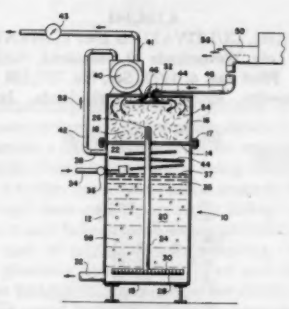


1. In farm implements of the type having rotatable disc blade means for obliquely attacking and preparing the soil, the improvement which comprises bearing means for axially supporting said disc blade means while simultaneously providing optimum support thereof against the lateral forces acting thereon, said bearing means including at least one radial bearing means having inner and outer axial races for taking the axle load, at least one thrust bearing means having a pair of lateral races for taking the lateral load, fixed hub means having a rotatable axle extending therethrough with at least a pair of disc blade members being disposed on either side of said hub means and being attached to said axle for rotation therewith, said radial bearing means and said thrust bearing means being circumferentially disposed about said axle and engaging the interior of said hub means with said radial and said thrust bearing means respectively having fixed and rotatable races, said hub means including a reduced diameter portion establishing inwardly directed annular shoulder means for engaging and restingly supporting said fixed race of said thrust bearing means, and spacer sleeve means slip-fitted about said axle with said thrust bearing means being circumposed thereabout for establishing an optimum non-binding relationship between said pair of lateral races irrespective of lateral compression forces developed in frictionally urging said pair of disc blade members together, said spacer sleeve means including an enlarged diameter portion establishing outwardly directed annular shoulder means for engaging and restingly supporting said rotatable race of said thrust bearing means.

4,136,747
METHOD AND MEANS FOR REDUCTION OF OXYGEN CONTENT IN DRILLING FLUID

Harvey E. Mallory, Tulsa, Okla., and James W. Ward, Riqua, United Arab Emirates, assignors to Loffland Brothers Company, Tulsa, Okla.

Filed Dec. 17, 1976, Ser. No. 751,255
Int. Cl.² E21C 21/00
U.S. Cl. 175—66 8 Claims



1. A method for drilling a well bore using drilling fluids and which comprises the displacement of substantially all of the oxygen in the drilling fluid with a suitable inert gas for reduction of corrosion in the drilling operation, and providing an atmosphere of the inert gas adjacent substantially any exposed surface of said drilling fluids for reducing contamination of the drilling fluids from the oxygen content of the ambient air.

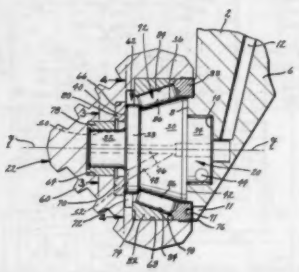
4,136,748
ROLLER-TYPE ROCK BIT AND BEARING ARRANGEMENT THEREFOR

Ronald P. Dickerhoff, Louisville, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Nov. 7, 1977, Ser. No. 848,801
Int. Cl.² E21B 9/08
U.S. Cl. 175—337 10 Claims

10. In a roller type rock bit having a body adapted to rotate in a drill hole, the improvement comprising: a spindle projected from the body and having a tapered intermediate portion provided with a tapered surface that converges toward the body; a generally coneshaped cutter surrounding the spindle and having large and small ends and a cavity opening out of its large end, with the spindle projecting into the cavity from the large end of the cutter, the cutter further having external

cutting elements arranged to bear against the end of the drill hole; a bearing cone fitted around the spindle and having a tapered bore, the taper of which matches the taper on the intermediate portion of the spindle, the cone further having an inner tapered raceway that is fixed in position with respect to the spindle; a bearing cup fitted into the cavity of the cutter and having an outer tapered raceway that is fixed in position with respect to the cutter; a single row of tapered rollers between the two raceways with the rollers having their tapered side surfaces against those raceways and their small diameter ends presented toward the small end of the cutter; a first rib fixed in position with respect to the spindle and projected outwardly from the tapered raceway thereon, the first rib



being located opposite the small diameter ends of the tapered rollers; a backing ring fitted against the cup and being detachable from the cutter, the backing ring having a second thrust rib on it with that thrust rib being fixed in position with respect to the cutter and located adjacent to the tapered raceway on the cup, the second rib being located opposite the large diameter ends of the tapered rollers so that the rollers are captured between the two ribs, whereby a thrust load applied in the direction which urges the thrust ribs together is transferred through the ribs and generally axially through the rollers, while a thrust load applied in the direction which urges the ribs apart is transferred through the raceways and generally transversely through the rollers.

4,136,749

DEVICE FOR CUTTING AND MEASURING PORTIONS OR LUMPS OF CAOUTCHOUC TO BE FED TO A MIXER FOR RUBBER

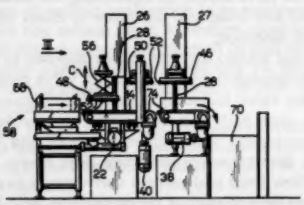
Gaetano Di Rosa, Pino Torinese (Turin), Italy, assignor to F.A.T.A. - Fabbrica Apparecchi di Sollevamento e Trasporto Ed Affini S.p.A., Turin, Italy

Filed Mar. 24, 1978, Ser. No. 889,806

Claims priority, application Italy, Jul. 15, 1977, 68643 A/77

Int. Cl.[2] G01G *19/04, 19/52;* B26D *7/00*

U.S. Cl. 177—25 **11 Claims**



1. A machine for cutting and measuring blocks or lumps of crude rubber to be fed to a mixer for rubber, comprising:

a first conveyor group including a first conveyor and a second conveyor operating to convey articles placed thereon in the same direction,

first and second cutting devices respectively fed with blocks of crude rubber by said first and second conveyors of said first conveyor group,

an output conveyor,

an automatic weighing machine,

means for conveying pieces of crude rubber cut by said cutting devices to said output conveyor which transfers them to said automatic weighing machine, said first conveyor being fixed in relation to said first cutting device, and said second conveyor being displaceable transversely in relation to the feed direction of said second cutting device, and

means for controlling the operation of said output conveyor which receives the pieces of crude rubber cut by said second cutting device in dependence on output signals from said automatic weighing machine.

4,136,750

TOP-LOADING BALANCE

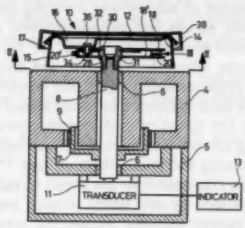
Ernst Strickler, Wolfhausen, Switzerland, assignor to Mettler Instrumente AG, Greifensee-Zurich, Switzerland

Filed Jul. 13, 1977, Ser. No. 815,147

Claims priority, application Switzerland, Dec. 14, 1976, 15690/76

Int. Cl.[2] G01G *21/22, 23/02*

U.S. Cl. 177—189 **10 Claims**



1. In weighing apparatus including a support, a pan carrier member, guide means on said support for guiding movement of said carrier member in a vertical direction, a weighing pan member, force transmitting means operatively interposed between said members for transmitting a force from said weighing pan member to said carrier member, said force transmitting means including a first resilient element yieldable under said force, cooperating abutment means on said weighing pan member and on said support for limiting the resilient deformation of said element by said force, transducer means connected to said carrier member and to said support for generating an electrical signal in response to said movement of said carrier member, and indicating means conductively connected to said transducer means and responsive to said signal for generating a perceptible signal indicative of said force, the improvement in said force transmitting means which comprises:

(a) a second resilient element juxtaposed to said first resilient element in said vertical direction; and

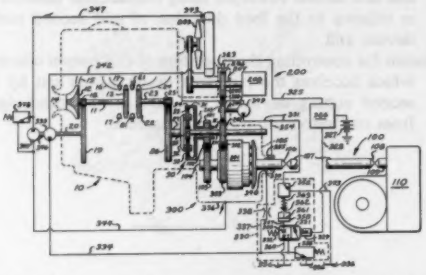
(b) a plurality of fastening means fastening said first and second elements to each other and to said members, in a position in which said elements and one of said members constitute parallelogram linkage means for guiding said weighing pan member in said direction during said movement of said carrier member.

4,136,751

POWER DIVIDER WITH GOVERNED SPEED CONTROL

Wesley A. Poore; Edward F. Randolph, and Harvey W. Rockwell, all of Springfield, Ill., assignors to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Oct. 29, 1976, Ser. No. 736,722
Int. Cl.[2] B60K *25/00*; F16H *37/14*
U.S. Cl. 180—70 R 13 Claims



13. In a vehicle having a power source, a propulsion drive system and an auxiliary drive system; a power divider system for dividing and controlling rotary power output of said power source; said power divider system comprising

power dividing means having an infinitely variable speed differential between a first output element and a second output element, said power dividing means in power receiving relation to said power source;

a first power path associated with a vehicle propulsion drive system in power receiving relation to said first output element of said power dividing means;

a second power path associated with a vehicle auxiliary drive system in power receiving relation to said second output element of said power dividing means;

power transfer means interposed between said first power path and said second power path for transferring power therebetween when the speed of said second power path exceeds a predetermined value and when the speed of said first power path exceeds a predetermined speed ratio with relation to the speed of said second power path;

speed sensing means, associated with said second power path for determining the speed thereof; and

control means responsive to the speed of said second power path determined by said speed sensing means for controlling said power transfer means for transferring power from said second power path to said first power path;

said control means comprising

a logic module for converting the speed determination of said speed sensing means into a plurality of control phases;

a pilot fluid pressure source;

valve means, having fluid receiving relationship with said pressure source, actuable in response to the plurality of control phases produced by said logic module;

actuator means in fluid pressure receiving relationship with said valve means and said pressure source;

a control fluid pressure source in fluid transmitting relationship with said power transfer means; and

control valve means responsive to said actuator means for varying the fluid pressure produced by said control pressure source for modulatingly adjusting the engagement of said power transfer means.

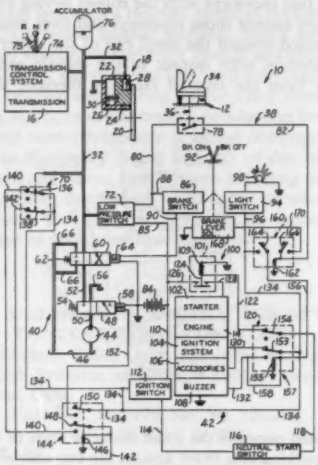
4,136,752

VEHICLE BRAKE CONTROL SYSTEM

Larry D. Friesen, and Stephen L. Palmer, both of Dallas, Oreg., assignors to Towmotor Corporation, Mentor, Ohio

Filed May 13, 1977, Ser. No. 796,568
Int. Cl.[2] B60T *7/02*
U.S. Cl. 180—101 10 Claims

1. In a vehicle brake control system of the type including a brake having an engaged position and a disengaged position; a seat having an element moveable between a first position corresponding to an occupied seat and a second position corresponding to an unoccupied seat; and control means connected to the brake for selectively operating the brake in said engaged and disengaged positions and being responsive to movement of said element to said second position for automatically placing the brake in said engaged position; the improvement comprising:



a brake actuating assembly having a control member moveable between a first position solely corresponding to said brake engaged position and a second position solely corresponding to said brake disengaged position, said brake actuating assembly connected to said control means and being of a construction sufficient for automatically moving the control member to said first position in response to movement of said element to said second position said control member being solely manually movable from said first position to said second position.

4,136,753

VEHICLE POWER STEERING SYSTEM

Stephen F. Merkel, Painesville, Ohio, assignor to Fluid Controls, Inc., Mentor, Ohio

Filed Feb. 11, 1977, Ser. No. 767,827
Int. Cl.[2] B62D *5/08*
U.S. Cl. 180—133 11 Claims

10. A fluid power system, comprising:

(a) a pair of reversible fluid actuators;

(b) a source of pressurized fluid for actuating said actuators, the source including a reservoir;

(c) control valve means for controlling the direction of fluid flow to and from said actuators to effect operation in a desired direction;

(d) first and second diverter valves disposed in a series fluid flow relationship with said control valve means, each said diverter valve including a pair of companion fluid flow paths, each path of each pair of companion flow paths communicating with a different one of said actuators;

(e) each diverter valve including flow means for dividing fluid flow from said control valve means to concurrently provide fluid to each of the companion fluid flow paths of its diverter valve;

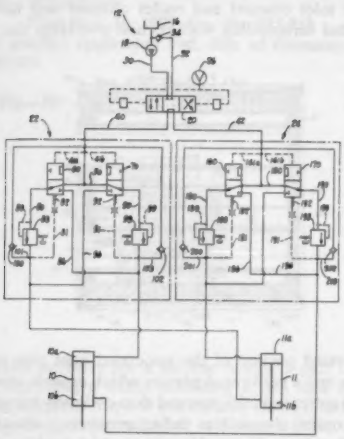
(f) one of the companion flow paths in said first diverter valve communicating with a first port in one said actuator and the other companion flow path of the first diverter valve communicating with a first port in the other actuator;

(g) one of the companion flow paths in said second diverter

valve communicating with a second port in said one actuator and the other companion flow path of the second diverter valve communicating with a second port in said other actuator;

(h) each diverter valve further including a pressure responsive means to divert the fluid flow, should pressure fall below a predetermined value in either of its companion flow paths due to conduit fracture or the like, from the path of decreased pressure to the other path, and

(i) the system including conduit means to return fluid exhausted by the actuators to the fluid reservoir.



4,136,754

PROCESS FOR SEISMIC EXPLORATION BY MEANS OF A DIRECTIVE SOURCE

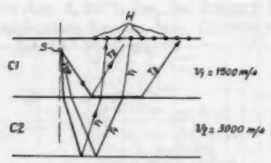
Michel Manin, Massy, France, assignor to Compagnie General de Geophysique, Massy, France

Filed Jun. 7, 1977, Ser. No. 804,455

Claims priority, application France, Jun. 17, 1976, 76 18420

Int. Cl.[2] G01V *1/13*

U.S. Cl. 181—111 **23 Claims**



1. A process of seismic exploration in an environment comprising at least one subsoil layer, a medium capable of propagating seismic disturbances superimposed on said subsoil layer, and a terrestrial atmosphere superimposed on said medium, wherein each elementary measurement of the exploration comprises the steps of:

positioning a plurality of seismic disturbance sources Sj (j = 1 to n) in spaced relation in said medium at various depths in relation to the interface of said medium with said terrestrial atmosphere;

positioning seismic collectors to receive seismic signals resulting from reflections of said disturbances propagated in said subsoil;

emitting seismic disturbances from said sources; and

receiving at said collectors said disturbances reflection signals,

wherein positioning said sources further comprises selecting the respective source depths and spacings so that the average ratio $F_\theta(f)$ of the spectral density $A_\theta(f)$ of seismic disturbance power transmitted in a predetermined direction to the spectral density $A_0(f)$ of seismic disturbance power transmitted vertically downwardly, for a predetermined band of frequencies, is less than about −20 dB, where $A\theta(f)$ = modulus of

$$\left[2i \sum_{j=1}^{n} \sin\left(2\pi f \frac{P_j}{v_1} \cos\theta\right) e^{2i\pi f \frac{x_j}{v_1} \sin\theta}\right]$$

and $A_0(f)$ = modulus of

$$\left[2i \sum_{j=1}^{n} \sin\left(2\pi f \frac{P_j}{v_1}\right)\right],$$

n being the number of sources, Xj (j = 1 to n) and Pj (j = 1 to n) being respectively the abcissas and depths of the respective sources,

v_1 being the propagation speed of seismic disturbances in said medium, f being a frequency in the spectral band of the disturbances emitted by the sources, and θ being the angle between the vertical and said predetermined direction.

4,136,755

LOUDSPEAKER SYSTEM FOR A VEHICLE

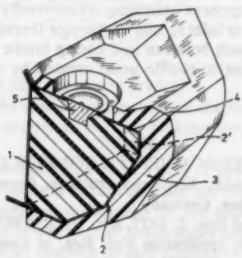
Friedrich Goes, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Apr. 4, 1977, Ser. No. 784,279

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1976, 2617068

Int. Cl.[2] G10K *10/00*; H05K *5/00*

U.S. Cl. 181—141 **7 Claims**



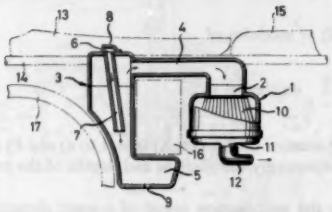
1. In a loudspeaker system for the passenger compartment of a vehicle, such as an automobile, having at least two loudspeakers arranged on opposite sides of the passenger compartment, the improvement comprising a rigid, hollow support element adapted for arrangement within the passenger compartment of the vehicle, wherein said hollow support element has a lengthwise dimension, measured in the direction of the spacing between the loudspeakers, which is substantially equal to the width of the passenger compartment; wherein said hollow support element is closed on all sides and has openings in the end regions thereof for receiving the loudspeakers; and wherein said hollow support element is at least partially filled with sound absorbing material.

4,136,756

SUCTION AIR MUFFLER FOR A MOTORCYCLE

Yoshio Kawamura, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Continuation of Ser. No. 672,331, Mar. 31, 1976, abandoned.
This application Dec. 20, 1977, Ser. No. 862,485
Claims priority, application Japan, Apr. 19, 1975, 50/53791
Int. Cl.[2] F01N *1/00*
U.S. Cl. 181—229 **4 Claims**



1. In a motorcycle including an internal combustion engine and having a forward direction of travel, the improvement of an air intake muffler assembly for the carburetor of said motorcycle internal combustion engine, said air intake muffler assembly comprising means including an air cleaner defining an inlet to said carburetor extending along an air path having a given air direction, a muffler casing defining a muffler chamber surrounding said carburetor air inlet through which all air entering said inlet passes, means defining the air intake port to said casing, said air intake port being arranged to open in a direction other than said forward direction of travel of said motorcycle, said air intake port thereby opening to always receive air therethrough during travel of said motorcycle from a direction other than the forward direction of travel of said motorcycle, pipe means extending from said casing intake port into said muffler chamber, said pipe means being arranged so that substantially all air entering said chamber is supplied through said pipe means, said pipe means defining a path along which air travels therethrough, said muffler assembly being constructed so that all air entering said carburetor air inlet passes along an air path which includes said air intake port of said casing, said pipe means and said muffler chamber, said assembly further including means for maintaining said air path between said air intake port and said carburetor air inlet with a directional component extending transversally to said given direction of said air inlet to said carburetor thereby to maintain a non-linear air path between said casing intake port and said carburetor air inlet to muffle noise created by said incoming air.

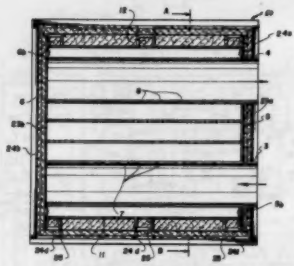
4,136,757

ABSORPTION MUFFLER CONSTRUCTION

Walter Bauerschmidt, Kirchheim-Otlingen, Germany, assignor to J. Eberspächer, Germany

Filed Dec. 2, 1977, Ser. No. 856,987
Claims priority, application Fed. Rep. of Germany, Apr. 4, 1977, 2715053
Int. Cl.[2] F01N *1/10, 1/12*
U.S. Cl. 181—256 **16 Claims**

1. An absorption muffler for flowing gases, particularly exhaust gases from internal combustion engines, comprising an oblong housing having spaced apart semicylindrical short side walls, long side walls longer than said short side walls on each side having intermediate synclinally drawn portions therebetween on each side, a rear wall and a front wall, an inlet pipe and an outlet pipe arranged in spaced parallel relationship and centered within the respective short side walls and extending into said front wall of said housing substantially up to said rear wall, and each having a circumferential portion with perforations and a remaining unperforated portion, inlet means defining an inlet channel connected to the perforated circumferential portion of said inlet pipe and extending in at least one helical curve around said inlet pipe, means defining an outlet channel connected to the perforated circumferential portion of said outlet pipe and extending in a helical curve around said outlet pipe, both said outlet pipe and said inlet pipe being enveloped with and spaced from a surrounding wall of the respective inlet channel and outlet channel and having an unperforated surrounding wall portion overlying the respective perforated portion of the associated inlet pipe and said outlet pipe and a perforated portion which extends around the associated outlet and inlet pipe and then obliquely between said inlet and outlet channels to define connecting channels between said outlet and inlet channels, a sound damping material covering each convolution of said helical curve of portion of said inlet and outlet channels and also covering said connecting channels on the interior of said housing.

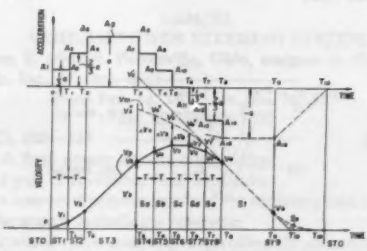


4,136,758

SPEED CONTROL SYSTEM OF ELEVATOR

Kenzo Tachino, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 22, 1977, Ser. No. 853,886
Claims priority, application Japan, Dec. 1, 1976, 51-144339
Int. Cl.[2] B66B *1/30*
U.S. Cl. 187—29 R **5 Claims**

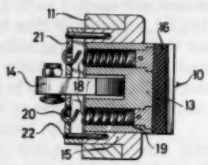


1. A speed control system of elevator in which a first speed pattern being an integration of an acceleration pattern and a second speed pattern decreasing at a constant acceleration for the remaining distance till the stoppage point, are set up, and a car is operated in accordance with the first speed pattern, and when the car reaches a deceleration decision point, the car is controlled in accordance with the first speed pattern before the first and second speed patterns are not coincident and then in accordance with the second speed pattern after they are coincident, in which comparing means for detecting the difference between said first and second speed pattens is provided and, after the car reaches said deceleration point, said acceleration pattern is successively reduced stepwisely in accordance with the output of said comparator and integration of the reducing thereof is used as said first speed pattern.

4,136,759
BICYCLE RIM BRAKE

Robert Schoch, Singen, Hohentwiel, Fed. Rep. of Germany, assignor to Weinmann GmbH & Co. KG, Singen, Hohentwiel, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 856,018
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655699
Int. Cl.² B62L 1/10
U.S. Cl. 188—24 4 Claims

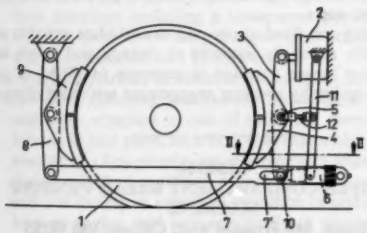


1. A brake assembly for a bicycle having a pair of frame members straddling a wheel including a rim, said assembly comprising a support fitted to each of said frame members and confronting one another adjacent said rim; a brake member carried by each of said supports for movements toward one another into braking engagement with said rim; an actuating lever carried by each of said supports and engageable with the respective brake members for moving them toward said rim; a cover on each of said supports and having an opening therein through which the associated lever extends; means coupled to said levers for operating the latter; said supports said brake members, and said actuating levers being symmetrical with respect to said frame members, and spring means acting on the respective brake members and yieldably biasing them in directions away from said rim, said spring means being connected to the associated cover for maintaining the latter on its support.

4,136,760
CLASP BRAKE RIGGING FOR A RAILWAY VEHICLE

Nils B. L. Sander, Malmo, Sweden, assignor to SAB Industri AB, Malmo, Sweden

Continuation of Ser. No. 733,305, Oct. 18, 1976, which is a continuation of Ser. No. 631,637, Nov. 13, 1975, abandoned. This application Aug. 1, 1977, Ser. No. 820,612
Claims priority, application Sweden, Nov. 15, 1974, 7414357
Int. Cl.² F16D 65/52
U.S. Cl. 188—198 1 Claim

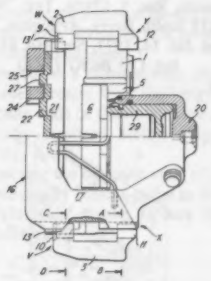


1. A clasp brake rigging for a railway vehicle comprising in combination, a first brake block, a live brake lever pivoted at an intermediate position to said first brake block, a piston applying force to one end of said brake lever, a second brake block, a dead brake lever suspended at one end from framework on said vehicle and pivoted on said second brake block at an intermediate position, a pull rod pivotally attached to the remaining end of said dead brake lever and having slotted guides intermediate the ends thereof, an axially acting brake regulator having a longitudinal body with two opposing ends and a separate connection to a control sleeve movable thereon to control the regulator mechanism, said regulator being coupled at one end of the body to the opposite end of said pull rod and slidably linked at the other end of the body at an intermediate position on said pull rod for limited movement in said slotted guides of said pull rod, the remaining end of said live brake lever at its end opposite the piston being slidably linked to said pull rod in said slotted guides, the other end of the body being pivotally coupled to the remaining end of the live brake lever to transmit a pulling force from the live brake lever to the pull rod via the brake regulator, and a control mechanism for said brake regulator determining when the slack exceeds a predetermined value consisting of a straight control lever arm having one end pivoted on the framework of said vehicle and having the remaining end connected directly to said movable control sleeve of said brake regulator, and a link on an intermediate position of said control lever arm connecting it to the junction of said first brake block and said live brake lever.

4,136,761
SPOT-TYPE DISC BRAKE

Jochen Burgdorf, Offenbach, and Roberto Stoka, Frankfurt, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 758,100, Jan. 10, 1971, abandoned, which is a continuation of Ser. No. 640,131, Dec. 12, 1975, abandoned, which is a continuation of Ser. No. 539,149, Jan. 7, 1975, abandoned. This application Jan. 5, 1978, Ser. No. 867,247
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1974, 2408519
Int. Cl.² F16D 65/02
U.S. Cl. 188—73.3 9 Claims



1. A spot-type disc brake comprising:
a rotating brake disc having an axis of rotation;
a fixed brake carrier to receive braking torque embracing said disc;
a pair of brake shoes, one of said pair of brake shoes being disposed on one side of said disc and the other of said pair of brake shoes being disposed on the other side of said disc, said one of said pair of brake shoes being guided and supported in an opening of said carrier;
a brake caliper embracing the edge of said disc supports said other of said pair of brake shoes and transmits an actuating force of an actuating device disposed on said one side of said disc directly to said one of said pair of brake shoes and indirectly to said other of said pair of brake shoes; and
a slidable guiding arrangement slidably connecting said caliper with said carrier parallel to said axis;
said arrangement including
a pair of grooves in said caliper parallel to said axis, one of said pair of grooves being spaced in one direction from said axis and the other of said pair of grooves being spaced in a direction opposite said one direction from said axis,
two pairs of spaced guide members carried by said carrier, a first pair of said spaced guide members engaging said one of said pair of grooves and a second pair of said

spaced guide members engaging said other of said pair of grooves,

each of said pair of grooves having a first guide surface lying in a common plane tangential to the outer circumference of said disc, a second guide surface extending from and perpendicular to said first guide surface and a third guide surface extending from said second guide surface and lying substantially at an angle of 45° with respect to said first guide surface, and

resilient means engaging said carrier and said actuating device remote from said grooves and said guide members to keep said two pairs of spaced guide members in engagement with said first and third guide surfaces at locations spaced from one another in the direction of said axis;

one guide member of each of said first and second pairs of said spaced guide members, at a first pair of points of engagement, rests against said first guide surface;

the other guide member of each of said first and second pairs of said spaced guide members, at a second pair of points of engagement adjacent said actuating device, rests against said third guide surfaces; and

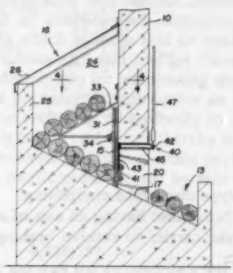
the portions of said caliper and said carrier adjacent said first, second and third guide surfaces are spaced from one another at a distance to not impair the alignment of said caliper in said arrangement.

4,136,762

LOG DISPENSER FOR FIREPLACE

Jacky R. Rosinbaum, Rte. 1, Clyde, Tex. 79510, and Terry L. Rosinbaum, 2612 Smith Barry, Arlington, Tex. 76010

Filed Jul. 14, 1977, Ser. No. 815,535
Int. Cl.[2] B65G *11/20*
U.S. Cl. 193—34 **8 Claims**



1. A log dispenser for use in combination with a generally vertical building partition comprising

a partition having an opening; an exterior box disposed at the exterior side of said partition opening; and an interior box disposed at the interior side of said partition opening; said exterior and interior boxes having a common inclined floor defining the bottom of said opening;

a closure door mounted for generally vertical sliding movement at the exterior side of said partition to close said opening; guide means mounted at the side edges of said opening, for guiding the sliding movement of said door;

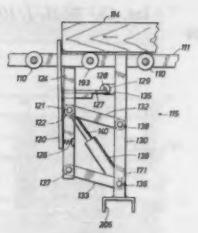
door operator means comprising a bell crank and a coupling link; said bell crank comprising a journal shaft, a lift arm disposed for swinging movement in a plane adjacent to the plane of said door, and a handle arm disposed for swinging movement in a plane adjacent to the interior side of said partition; means pivotally connecting said coupling link to said door and to said lift arm; and bushing means mounted in said partition for rotatably supporting said journal shaft.

4,136,763

SAWMILL STOP ASSEMBLY MODULE

Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979

Filed Dec. 6, 1976, Ser. No. 747,558
Int. Cl.[2] B65G *13/00*
U.S. Cl. 193—35 A **2 Claims**



1. Apparatus for controlling the movement of an elongate body traveling in a sawmill and the like, comprising

a pair of vertical support members fixedly positioned on each side of the expected course of travel of said body,

a pair of generally vertical support arms positioned on each side of said course at a location downstream of said support members,

a first pair of bracket members each pivotally attached at one end to the lower end of a respective one of said support arms and also pivotally attached at the other end to a point adjacent to but spaced from the lower end of a respective one of said support members,

a second pair of bracket members each pivotally attached at one end to a point adjacent to but spaced from the upper end of a respective one of said support arms and also pivotally attached at the other end to a point adjacent to but spaced from the upper end of a respective one of said support members,

first sleeve member rotatably mounted between said one end of each of said second pair of bracket members,

plate member fixedly mounted on said first sleeve member and spanning said pair of vertical support arms,

a second sleeve member rotatably mounted between said other end of each of said first pair of bracket members,

a pneumatic cylinder and piston assembly connected between said first and second sleeve members for raising and lowering said plate member at a preselected location along said course of travel of said elongate body,

an electric switching means having a pivotally movable actuator, and

an actuating arm fixed at one end to said plate member and upwardly arcuately movable to engage and move said switching means actuator in response to tilting of said plate member by abutting engagement with said elongate body.

4,136,764

MULTIPLE COMPARTMENT BREAD VENDING MACHINE

Alice A. Johnson, 448 Fremont Ave., Chicago, Ill. 60185

Filed Feb. 2, 1977, Ser. No. 744,182
Int. Cl.[2] G07F *11/62*
U.S. Cl. 194—32 **7 Claims**

1. A vending apparatus for storing, displaying and selectively dispensing packaged food articles therefrom, comprising in combination:

housing structure means having side, top, bottom and rear wall portions, said housing structure means arranged to be transported to the site of intended use and positioned as a floor mounted unit;

a plurality of discrete spaced-apart compartments formed in the said housing means, each compartment being a size

and configuration readily to receive packaged food articles having a size and configuration substantially of that of a loaf of bread;

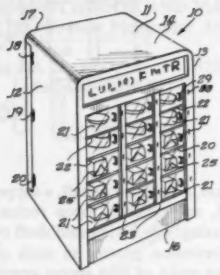
a corresponding plurality of discrete spaced-apart hinged door members secured to the front portion of said housing means, each hinged door member being placed in registry with a corresponding one of said plurality of compartments to allow easy access thereto when said door member is opened, said door members accumulatively being combined to form a front wall of said housing;

a corresponding plurality of discrete spaced-apart coin receiving, and door release mechanisms, associated with each one of said plurality of hinged door members to allow operation of only that door member door release mechanism which receives coins therein, to thereby permit opening of the associated door member and allow the user thereof to remove the packaged food articles from the now opened compartment;

said apparatus being substantially completely assembled prior to delivery to the intended site where it is to be used as a floor-mounted unit;

said rear wall of said housing being provided with hinge members formed along one edge thereof and being arranged to be opened to allow access to all of said compartments without opening of said plurality of said discrete spaced-apart door members from the front;

each of the said plurality of said plurality of said discrete spaced-apart hinged door members including a handle



member extending outwardly therefrom to be easily grasped by the user for opening the door member after the appropriate amount of coinage has been inserted into said coin receiving and door release mechanism;

each of the said plurality of discrete spaced-apart hinged door members including a transparent portion to allow visual inspection of the packaged food article then and there contained in said compartment;

each of said plurality of discrete spaced-apart coin receiving and door releasing mechanisms including a plate, each said plate attached to one of said door members, a slot formed in said plate, an arm cooperable with said slot and pivoted at a first pivot point to selectively engage said slot during a locked condition of said door and to disengage said slot during an unlocked condition of said door, and a lever engaging said arm selectively to pivotally actuate said arm to engage and disengage said slot as a result of the absence or presence, respectively, of appropriate coinage inserted into said coin receiving and door release mechanism;

said arm being positioned and arranged relative to said lever at right angles thereto, said lever being positioned immediately adjacent a coin receiving access, and pivoted about a point rearwardly of said access to allow the weight of the coinage to actuate said lever and move said arm out of engagement of said slot; and

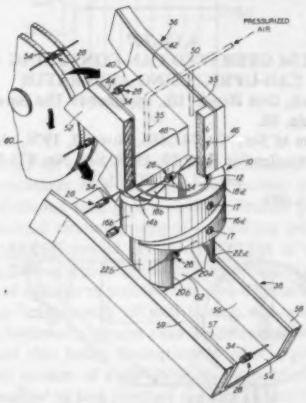
said lever being actuated as a result of the weight of the exact coinage inserted into said coin-receiving opening.

4,136,765

METHODS OF AND APPARATUS FOR ORIENTING ELECTRICALLY ASYMMETRICAL DEVICES WITH MAGNETIC HANDLING

Bruce C. Abraham, Reading; Loring D. Emery, Jr., Hamburg; Harold A. Griesemer, Reading, and Robert H. Stroup, Fleetwood, all of Pa., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Jun. 6, 1977, Ser. No. 804,120
Int. Cl.² B65G *47/24*
U.S. Cl. 198—381 **11 Claims**



1. A method of positioning a device having magnetic properties and a longitudinal axis, about an axis perpendicular to the longitudinal axis, which comprises:

disposing the device in a nonmagnetic cylindrical means having a diameter greater than the length of the device, such that opposite ends of the device are adjacent respective diametrically opposed helical magnetic means of opposite polarity; and

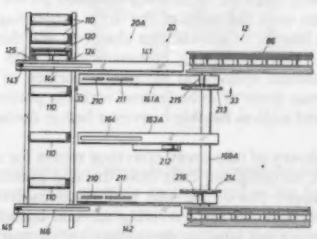
magnetically attracting the opposite ends of the device along respective substantially helical paths as the device moves through the cylindrical means, to turn the device about the perpendicular axis.

4,136,766

SAWMILL PULL-OFF ASSEMBLY MODULE

Roy R. Pryor, and Harold A. Pryor, both of P.O. Box 26, Woodville, Tex. 75979

Filed Dec. 6, 1976, Ser. No. 747,534
Int. Cl.² B65G *37/00*
U.S. Cl. 198—485 **22 Claims**



12. In a sawmill and the like including conveyor means for longitudinally conducting timbers and other elongate bodies along a path, removal means in combination therewith comprising

an engaging member rotatable substantially ninety degrees between a first generally erect position wherein said engaging

member projects at least partially above said conveyor means and a second generally supine position below any body carried on said conveyor means,

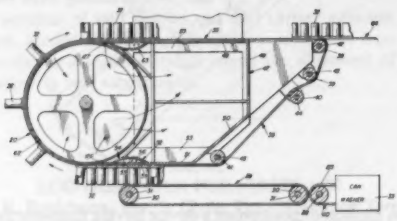
actuating means responsive to the arrival of a selected one of said bodies on said conveyor means for moving said engaging member into engagement with said selected body and across said conveyor means, and

a vertically arcuately movable assembly extending from said conveyor means for moving bodies engaged by said engaging member to a preselected location, said movable assembly, conveyor means and engaging member occupying the same substantially horizontal plane.

4,136,767
VACUUM OPERATED CAN-CONVEYING AND CAN-UPRIGHTING APPARATUS

Steve Sarovich, Oak Brook, Ill., assignor to The Sardee Corporation, Alsip, Ill.

Continuation of Ser. No. 741,468, Nov. 12, 1976, abandoned.
This application Jan. 19, 1978, Ser. No. 871,092
Int. Cl.[2] B65G *15/58*
U.S. Cl. 198—689 **26 Claims**



1. A vacumm operated can-conveying and can-uprighting apparatus for uprighting a bank of cans received from a can washer or first work station in inverted position, that is, with the open tops of the cans facing downwardly and the closed bottom walls thereof facing upwardly and conveying the said bank of cans in upright position to a can printing or labeling apparatus, or other work station, comprising

(a) a supporting frame;

(b) a rotary foraminous drum or cylinder rotatably mounted on the said supporting frame and having openings formed in its external cylindrical peripheral surface;

(c) a perforated endless flexible conveyor belt constructed and arranged to travel over and in contact with the said open external cylindrical peripheral surface of the said rotary foraminous drum or cylinder through an arc of travel sufficient to upright the cans from an inverted position, said belt having

(1) a generally horizontal bottom run; and

(2) a generally horizontal upper run;

(d) a vacuum chamber or housing mounted on the supporting frame with the body of the drum projecting radially into the interior of the vacuum chamber, and the vacuum chamber thereby having communication with the said open external cylindrical peripheral surface of the said foraminous drum or cylinder and with the portion of said perforated endless flexible conveyor belt in contact therewith

(e) can delivery of take-away conveyor means for receiving the bank of uprighted cans from the said generally horizontal upper run of the said perforated endless flexible conveyor belt and for delivering the said uprighted cans to a printing and labeling apparatus or other work station;

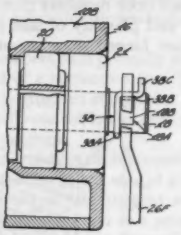
(f) can-conveying means for conveying said bank of cans from a can washer in inverted position below and in a direction generally parallel and in close spaced proximity to the said generally horizontal bottom run of the said perforated endless flexible conveyor belt;

(g) means for creating vacuum in the said vacuum chamber or housing and from said vacuum chamber through the openings in the said rotary foraminous drum or cylinder and through the said perforated endless flexible conveyor belt whereby the said bank of cans are gripped by vacuum applied from the said vacuum chamber or housing through the said rotary foraminous drum and said perforated endless flexible conveyor belt to the closed bottom walls of the said cans and transported from said can conveying means to said endless belt and thence are carried by the said perforated endless flexible conveyor belt around the said external peripheral surface of the said rotary foraminous drum or cylinder by said vacuum applied to the bottom walls of the cans, the cans being uprighted as they travel over the said horizontal upper run of the said perforated endless flexible conveyor belt to the said can delivery or takeway means.

4,136,768
SHAFT RETAINER ARRANGEMENT

Earl W. Yateman, and Gerald D. Sanderson, both of Belleville, Canada, assignors to Allis-Chalmers Canada, Limited, Lachine, Canada

Filed Sep. 22, 1977, Ser. No. 835,710
Int. Cl.[2] B65G *39/12*
U.S. Cl. 198—830 **24 Claims**



1. In combination, a stationary shaft, a support bracket for an end of said shaft, an upwardly open recess in said support bracket for supportingly receiving said shaft contiguous an end of said shaft, a retention groove in each of the oppositely disposed bounding walls of said recess contiguous the upper portion of each of said opposite walls, a retention clip formed of spring-like material for retaining said shaft against upward movement in said upwardly open recess when said shaft is positioned in said recess, said retention clip comprising an arcuate portion positioned in encircling relation to a portion of the periphery of said shaft, said retention clip comprising a pair of laterally spaced lug portions respectively extending in a direction axially of said shaft from circumferentially opposite ends of said arcuate portion of said retention clip, said lug portions snapping into the respective retention grooves of said oppositely disposed bounding walls of said recess when said shaft is positioned in said recess, whereby said lug portions of said retention clip axially overlie oppositely positioned upper surface portions of said shaft when said shaft is positioned in said recess to thereby prevent upward movement of said shaft in said recess.

4,136,769
DOOR OPERATING MECHANISM

Joseph Dostal, Jr., Rte. 2, Rice Lake, Wis. 54868

Filed Jun. 2, 1977, Ser. No. 802,910
Int. Cl.[2] B65G *15/60*
U.S. Cl. 198—861 **6 Claims**

1. In combination a hinged door and a mechanism for opening and closing said door comprising:

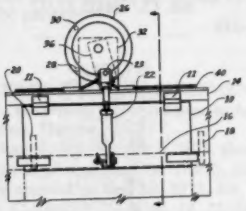
(a) a door having a hinge at the top edge thereof;

(b) a pulley located above said door;

(c) a connecting rod hingedly connected on one end to said

door and pivotably connected to a peripheral edge of said pulley at opposite end;

(d) stop means associated with said pulley to limit rotation thereof in both the clockwise and counterclockwise directions located so as to allow rotation of said pulley in one



direction slightly past the point where said pivotable connection is at its lowermost point of travel and in the opposite direction slightly past its uppermost point of travel;

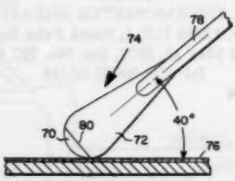
(e) an elongated flexible means wrapped around said pulley suitable for causing rotation thereof in each direction.

4,136,770

SAFETY MATCHBOOK AND MATCHES

Charles C. Cohn, 123 S. New Hampshire Ave., Atlantic City, N.J. 08401

Filed Jul. 28, 1977, Ser. No. 819,758
Int. Cl.[2] A24F *27/00*
U.S. Cl. 206—106 **6 Claims**



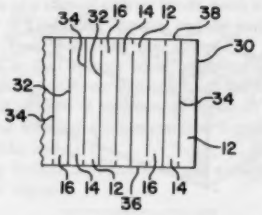
1. A match comprising a substantially straight elongated stem and a head located at one end thereof, said head comprising a bulbous mass of flammable material adapted to ignite when rubbed against a phosphorus-containing friction surface, and characterized by means providing a coating of material incapable of igniting when rubbed against a phosphorus-containing friction surface, said coating being located at the tip of said head, and preventing ignition of the match when rubbed against a phosphorus-containing friction surface with the stem substantially perpendicular to said surface.

4,136,771

ARTICLE CARRIER AND METHOD OF MAKING SAME

Ronald C. Owen, Harwood Heights, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 14, 1973, Ser. No. 360,081
Int. Cl.[2] B65D *85/72*
U.S. Cl. 206—150 **1 Claim**



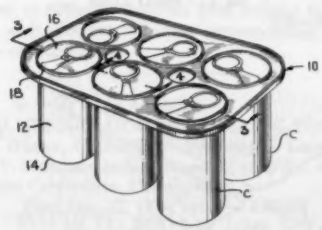
1. A carrier for carrying a selected number of like articles such as containers in a package, said carrier comprising a length of flattened tubing of a resilient flexible plastics material, the internal circumference of said tubing being less than the outer circumferential dimensions of one of said articles, said tubing having a plurality of slits of one less in number than said selected number of articles, said slits disposed in a parallel relationship transversely of said tubing and spaced apart a distance substantially greater than the thickness of said tubing, each of said slits being discontinuous over a predetermined incremental section of said tubing to form a series of bands equal in number to said selected number of articles and interconnected by said incremental sections, each of said incremental sectional having at least one opening therethrough, and said incremental sections being disposed alternately in diametrically opposed areas of said tubing.

4,136,772

REUSABLE CAN CARRIER

Carmen T. Mascia, Clarendon Hills, and Gary K. Hasegawa, Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Sep. 9, 1977, Ser. No. 831,979
Int. Cl.[2] B65D *85/62, 71/00*
U.S. Cl. 206—199 **15 Claims**



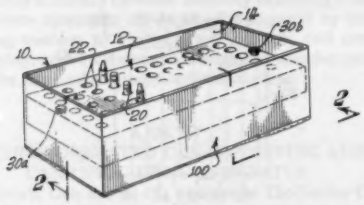
1. A new article of manufacture comprising a reusable carrier for cans, said reusable carrier being in the form of a substantially thick sheet of resilient plastics material, said sheet having a preselected number of openings therethrough, each of said openings being of the same depth as the thickness of said sheet, each of said openings being frusto-conical in transverse section and having a wide dimension for facilitating the forced passage of an enlarged end portion of a can through said opening and a narrow dimension cooperating with a portion of said sheet to engagably retain an intended can.

4,136,773

CONTAINER FOR ARTIST'S CRAYONS

Darcy L. Booth, 12040 E. Ranchito St., El Monte, Calif. 91732

Continuation-in-part of Ser. No. 648,256, Jan. 12, 1976, abandoned. This application May 23, 1977, Ser. No. 799,494
Int. Cl.[2] B65D *85/28, 25/10*
U.S. Cl. 206—214 23 Claims



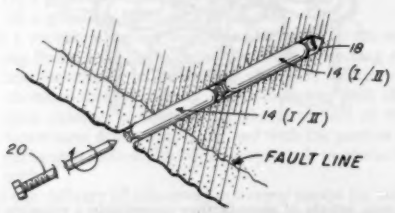
1. A container and organizer for crayons, comprising:
an upwardly open box defined by bottom and side walls,
a removable holder plate configurated to fit within the side walls and defining a plurality of orifices sized to receive the crayons,
means removably securing the holder plate in a normally horizontal position in selected positions at different heights relative to the normally vertical side walls wherein the crayons extend downwardly to be supported by the bottom and extend upwardly above the holder plate,
said securing means including recess and projection means interengaging the holder plate and the box, and said securing means being manually operable to releasibly position the holder plate at selected respective heights relative to the box side walls.

4,136,774

ROCK BOLT RESINS

Ramkrishna Ghoshal, Milwaukee, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Dec. 22, 1977, Ser. No. 863,134
Int. Cl.[2] B65D *25/08*
U.S. Cl. 206—219 3 Claims



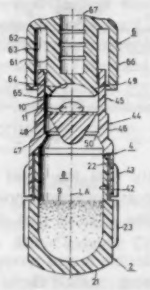
1. A two pocket package of resin and curing agent comprising, in one pocket, a linear pre-polymer polyester reaction constituent, capable of being crosslinked and thereby cured to a thermoset state, together with sodium bicarbonate and a calcium carbonate filler; and, in a second pocket, a curing agent for the resin, which starts the reaction, together with water and an acid which is stronger than carbonic acid, that is, Ka $>4.5 \times 10^{-7}$, but non-reactive with the curing agent.

4,136,775

MIXING CAPSULE

Saul Zaltsman, Savyon, Israel, assignor to Silmet Ltd., Givatayim, Israel

Filed Aug. 17, 1977, Ser. No. 825,395
Claims priority, application Israel, Aug. 10, 1977, 52695
Int. Cl.[2] B65D *81/32*
U.S. Cl. 206—219 9 Claims



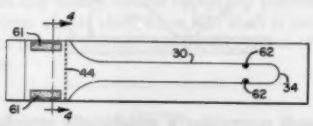
1. A mixing capsule for mixing a first material with a second material, comprising: a first tubular housing section and a second tubular housing section removably attached to each other and defining between them a first chamber for receiving the first material to be mixed; said first housing section being closed at the bottom and defining the bottom wall of the first chamber; said second housing section including a partition integrally joined to its inner surface by a thin connecting web and serving as a temporary top wall closing the first chamber; said second housing section further including a tubular neck extending above said partition; and a plunger having a tubular stem disposed in the neck of said second housing section; the lower face of the plunger defining with said partition a second chamber for receiving the second material to be mixed; said plunger being depressable within the neck of the second housing section to cause the partition to be severed along its connecting web from the inner surface of the second housing section and thereby to cause the material in the second chamber to drop into and mix with that in the first chamber; the lower face of said plunger being engageable with said partition and being formed with a recess of sufficient depth that depression of the plunger severs the connecting web before the plunger can apply a compressive force to the material in the second chamber.

4,136,776

DISPOSABLE THERMOMETER SHEATH PACKAGE

George W. Poncy, 12540 U.S. 1, North Palm Beach, Fla. 33408

Filed May 16, 1977, Ser. No. 797,385
Int. Cl.[2] B65D *85/38*
U.S. Cl. 206—306 6 Claims



1. A sheath package comprising a pair of inner strips of flexible thermoplastic material bonded together along a tear seal shaped to form a sheath out of said inner strips with an open mouth and designed to receive an instrument, a pair of cover strips sandwiching said inner strips and bonded to said inner strips, a weakened line extending across the width of said cover strips at the mouth of said sheath, to define a tab portion between said weakened line and the adjacent ends of said

strips, said inner strips and said cover strips all being bonded together along the sides of said tab portion to define a pocket in said tab portion between both said bonded sides and said inner strips, said inner strips not being bonded together in said tab portion between said bonded sides of said tab portion from the distal end thereof to the mouth of said sheath so that said pocket provides an opening from the mouth of said sheath to the exterior of the package.

4,136,777

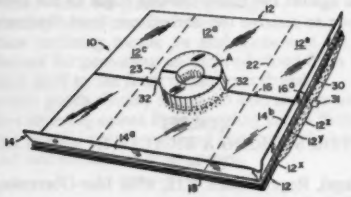
PACKAGE WITH TEAR ELEMENT

Ridley Watts, Jr., Cleveland, Ohio, assignor to American Packaging Corporation, Hudson, Ohio

Continuation of Ser. No. 52,782, Jul. 6, 1970, abandoned, which is a continuation-in-part of Ser. No. 17,575, Mar. 9, 1970, abandoned. This application Sep. 18, 1972, Ser. No. 289,870

Int. Cl.[2] B65D *17/20, 65/34, 77/36*

U.S. Cl. 206—469 **6 Claims**



1. A package comprising a panel scored to form three side-by-side sections with the two end sections foldable beneath the center section, a packaged article, a plastic film over said article and adhered only to the surface of the center one of the three sections and drawn substantially around the article, and a tear element extending beneath the film, over the article, across the panel, and secured to the package on opposite sides of the article by the film, with one end extending from between the panel and film, said panel being shaped and scored to facilitate its being folded to form a box that surrounds said film and packaged article.

4,136,778

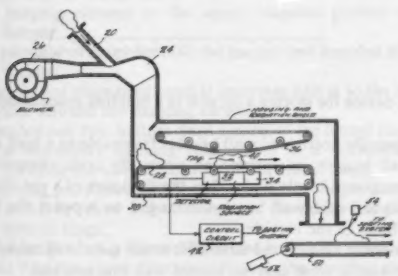
LINEN SORTER

Jimmie J. Wortman, Chapel Hill; Richard A. Whisnant, Greensboro, and Larry K. Monteith, Raleigh, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Continuation of Ser. No. 604,081, Aug. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 565,133, Apr. 4, 1975, abandoned. This application Oct. 14, 1977, Ser. No. 842,158

Int. Cl.[2] B07C *5/346*

U.S. Cl. 209—589 **39 Claims**



1. A method of sorting articles or the like comprising the steps of:

passing, substantially one at a time, randomly oriented articles past a source of impinging radiation, at least some of said articles having as a part thereof a quantity of at least two materials which produce x-ray secondary radiation in response to exciting radiation impinging thereon, and which form a code identifying the article,

impinging said exciting radiation onto said articles from said source so that said secondary radiation is produced,

detecting discretely each of the secondary radiations and producing a signal indicating the passing articles including the steps of applying said secondary radiation to an x-ray detector to produce a series of electrical output pulses at each of a plurality of energy levels, each associated with a quantity of a different material and the number of pulses in a given time indicating the amount of x-ray radiation detected at that energy level, applying said pulses to a multi-channel analyzer and counting the number of pulses produced at each of said energy levels in a given time to determine whether a given material is present as a part of said article, and

controlling further movement of said article in accordance with said signal.

4,136,779

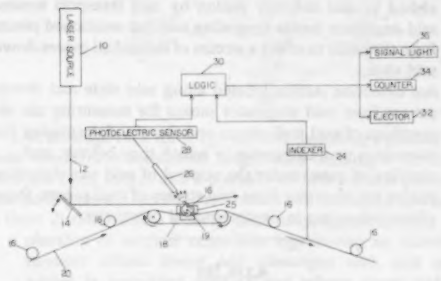
AMPULE SCORE LINE DETECTION

Robert J. Bieringer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 22, 1977, Ser. No. 863,200

Int. Cl.[2] B07C *5/00, 5/342*

U.S. Cl. 209—524 **21 Claims**



1. A method of inspecting an ampule having a constriction to determine whether or not a diffusely reflecting score line is present on said constriction comprising the steps of:

(a) projecting a laser beam towards the constriction of said ampule, said laser beam being directed parallel to and slightly below a tangent to the constriction;

(b) determining whether the laser beam is specularly reflected or diffusely scattered after striking the constriction, with specular reflection corresponding to the absence of a score line.

4,136,780

MAIL SINGULATION AND CULLING SYSTEM

James R. Hunter, Chadds Ford; Sebastian J. Lazzarotti, and Robert S. Bradshaw, both of Broomall, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 27, 1977, Ser. No. 864,258

Int. Cl.[2] B07C *5/00, 5/344*

U.S. Cl. 209—539 **15 Claims**

1. A system for culling and singulating mixed mail pieces including flats comprising in combination:

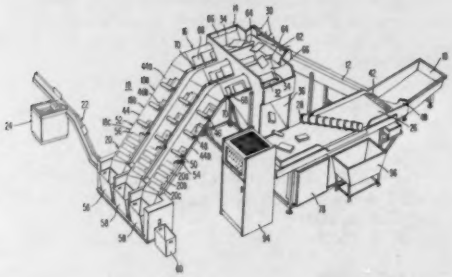
at least one receiving station, an input conveyor for depositing said mail pieces in said receiving station, a delivery station disposed in contiguity with said receiving station,

common transport means linking said receiving station to said delivery station, the portion of said transport means within said receiving station being so situated and having physical dimensions such that it captures a limited number of predetermined types of the mail pieces deposited within

said receiving station, and conveys them to said delivery station, said receiving station including means for selectively precluding the capture of any mail pieces by said transport means,

a chute disposed below said receiving station for catching those mail pieces not captured by said transport means, means coupling said chute to said input conveyor for continuously recirculating at least a portion of the uncaptured mail pieces to said receiving station,

singulator means comprising an inclined slide coupled to said delivery station for receiving the mail pieces furnished to said delivery station by said transport means, said singulator means separating said last mentioned pieces from the other to effect a stream of individual pieces down said slide,



a size detection station located along said slide and downstream from said singulator means for measuring the dimensions of said mail pieces and thereby determining the respective mail categories to which they belong, and

a plurality of gates under the control of said size detection station for diverting from said stream of mail pieces, those pieces belonging to predetermined categories.

4,136,781

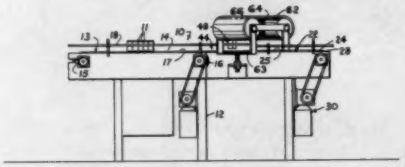
CAN SORTING APPARATUS

Vernon L. Perry, Walla Walla, Wash., and Ronald D. Kelsey, Milton-Freewater, Oreg., assignors to Applied Magnetics Corporation, Goleta, Calif.

Filed May 31, 1977, Ser. No. 802,267

Int. Cl.² B07C 5/00

U.S. Cl. 209—552 **8 Claims**



1. A can sorting apparatus for selectively sorting cans in which the cans have a known height, width and diagonal dimension, comprising:

a can conveyor for supporting a plurality of cans and for successively rapidly moving the cans forward in a conveyor path past a sorting station;

an overhead separating conveyor overlying the can conveyor at the sorting station and extending transverse to the conveyor path;

said overhead separating conveyor having a wide continuous belt with a transverse continuously moving lower flight vertically spaced above the can conveyor a distance greater than the height of the cans and less than the diagonal dimension of the cans in which the belt has a width substantially greater than the diameter of the can;

said wide belt having a surface adapted to enable a can to readily slide on the surface;

an energizable electromagnet associated with the overhead conveyor and directly above the conveyor path for generating a magnetic force of sufficient strength to lift a rapidly moving can from the can conveyor and hold the lifted can in frictional engagement with the moving lower flight of the overhead separating conveyor to impart a transverse force to the lifted can to bias the lifted can laterally while enabling the lifted can to slide forward on the belt surface of the overhead separating conveyor to thereby progressively displace the rapidly moving can from the conveyor path;

control means for sensing the presence of a desired can at the sorting station and selectively energizing the electromagnet to lift the desired can from the can conveyor and hold the can against the lower moving flight of the overhead conveyor to remove the desired can from the conveyor path.

4,136,782

DEVICE FOR STORING A BICYCLE IN A BUILDING SPACE

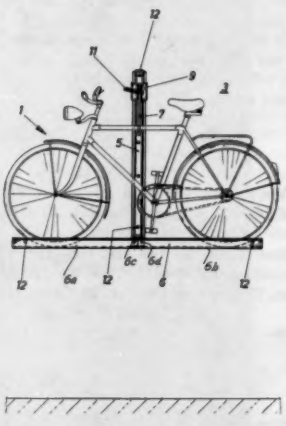
Kurt W. Hugel, Regulshausen J 11, 6580 Idar-Oberstein, Fed. Rep. of Germany

Filed Nov. 18, 1977, Ser. No. 852,615

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1976, 2652992

Int. Cl.² A47F 7/04

U.S. Cl. 211—19 **3 Claims**



1. A device for storing a bicycle in a building space comprising

a generally horizontal wall bracket fastenable to a wall, said wall bracket comprising an upwardly open channel dimensioned barely wider than the thickness of a tire of said bicycle, said wall bracket arranged to support the two wheels of the bicycle,

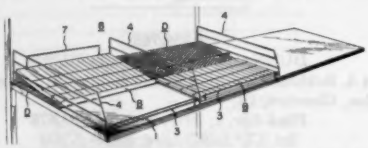
a generally vertical rail fastenable to the same wall extending upwardly from said horizontal wall bracket, and

a swivel hook for the suspension of the bicycle interchangeably and adjustably secured along said vertical rail, said hook positionable to engage a portion of the bicycle frame when the wheels thereof are on the horizontal bracket such that the bicycle leans away from the wall and is inclined to the wall.

4,136,783
SHOWCASE EQUIPMENT

Masashi Karashima, 40-7 Sangenjaya 2-chome, Setagaya-ku, Tokyo, Japan

Filed Mar. 30, 1977, Ser. No. 782,785
Claims priority, application Japan, Feb. 28, 1977, 52-20274; Feb. 28, 1977, 52-20275
Int. Cl.[2] A47F 5/00
U.S. Cl. 211—49 D 2 Claims

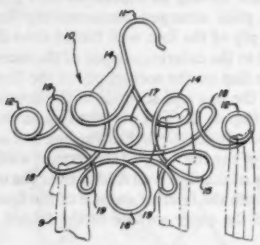


1. A showcase for goods comprising:
a plurality of horizontal shelves;
surface inclining means on said shelves at the rear edge thereof for providing an inclined slope from the rear of each shelf to the front of each shelf; and
movable goods display means on said shelves and said surface inclining means for supporting goods thereon and for moving said goods rearward and forward on said shelves and said surface inclining means.

4,136,784
SCARF HANGER

Gladys Knobel, 340 Greenbay Rd., Glencoe, Ill. 60022, and Theodore Prisland, 632 Melody La., Highland Park, Ill. 60035

Filed Nov. 21, 1977, Ser. No. 853,129
Int. Cl.[2] A47F 5/01
U.S. Cl. 211—119 7 Claims

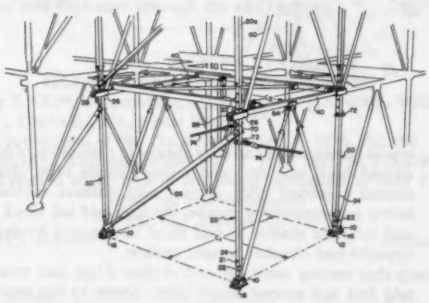


1. A hanger for scarfs and like suspendable fabric products comprising, in combination,
a hanging element at the upper intended portion of the hanger,
a plurality of rings beneath the hanger and coupled directly thereto,
two lateral rings positioned at extremes lateral to the hanger and beneath the hanging element,
two top and two bottom rings central of the lateral rings and in essentially flanking relationship to a horizontal axis between the central portion of the lateral rings,
one ring positioned below the hanger, the major portion of which is below the axis between the centers of the two bottom rings,
said hanger being formed from two bent wire portions,
said first bent wire portion including the hanging element, the two top rings, the two bottom rings, and the ring positioned below the hanger,
a second separate element comprising the lateral two rings at the remote portions thereof, the same being proportioned to overlie and being connected between the centers of the two top rings and two bottom rings, whereby upon hanging the subject hanger for scarfs on the hanging element, the weight of the aforesaid recited rings is therebeneath and holds the same in an essentially vertical plane, and whereby when scarfs or like suspendable fabric elements are positioned in the various rings as identified hereinabove, a static balance is created, and the scarfs and like suspendable fabric products are separated each from the other suitable for insertion and removal without interfering with the positioning of the remaining scarfs or the like suspendable fabric products.

4,136,785
MARINE CARGO STOWAGE RACK

Jerome A. McDevitt, El Toro, Calif., assignor to Waco Scaffold & Shoring Company, Arlington Hts., Ill.

Filed Sep. 6, 1977, Ser. No. 830,883
Int. Cl.[2] A47F 7/00; E04G 1/06
U.S. Cl. 211—190 7 Claims



1. A stowage rack for cargo carriers including a plurality of base members of substantial height each defining a vertically directed open socket and a plurality of first vertical pins supported in pairs adjacent to each socket and extending upwardly a short distance above a cargo deck around each socket,
a plurality of vertical extendible legs having an extension member whose lower end telescopes with said open socket in supported relation and whose upper end includes,
a support collar means having a socket of the same opening size and shape as said open socket and a laterally extending cross head portion parallel with said base below it having second vertical pins extending upwardly and aligned with said first vertical pins,
girder means terminally having an opening received on one of said second vertical pins and defining crosswise channel sections adjacent thereto having vertical pins therein,
beam members received in said crosswise channel sections having openings received on said last vertical pins, and
side brace means interconnecting said girder means and one of the first vertical pins for maintaining said leg and girder at right angles to each other.

4,136,786
LOGGING SYSTEM AND YARDER THEREFOR

Gary R. Morrow, Sedro-Woolley, and Larry L. Dargitz, Burlington, both of Wash., assignors to Skagit Corporation, Sedro Woolley, Wash.

Continuation-in-part of Ser. No. 510,540, Sep. 30, 1974, abandoned. This application Feb. 24, 1976, Ser. No. 660,883
Int. Cl.[2] B66C 21/00
U.S. Cl. 212—76 7 Claims

1. A system for yarding logs comprising
a yarder having a tower with a skyline fairleader, inhaul and outhaul fairleaders and idler sheaves, a skyline drum, first and second single layer drums and drive means connecting said skyline drum and at least one of said single layer drums,

means for selectively driving said skyline drum and at least one of said single layer drums,

a cable storable on said skyline drum and having one end attached thereto;

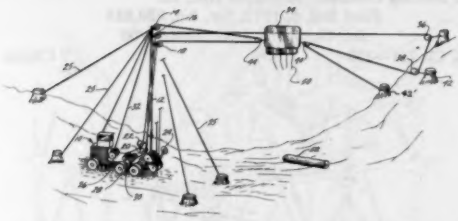
a carriage including at least one supporting sheave, a second sheave carried on the side nearer said yarder, a third sheave carried on the side farther from said yarder, and means for supporting choker cables;

a tail block;

a tail hold sheave;

and an anchor;

said cable being reeved from said skyline drum through said skyline fairleader, around said second sheave, over said



inhaul fairleader and an idler sheave in a plurality of loops around both said first and second single layer drums, around a second idler sheave, said outhaul fairleader, below said supporting sheave, through said tail block and said tail hold sheave to said third sheave and having its opposite end attached to said anchor;

such that reeling cable off said skyline drum and rotating said first and second single layer drums to increase the amount of cable in said skyline and between said single layer drums and said carriage tends to lower said carriage, and reeling cable onto said skyline drum and rotating said single layer drums to decrease the amount of cable between said single layer drums and said carriage tends to raise said carriage.

4,136,787

ELASTIC HINGE OF A CENTRAL BUFFER COUPLING FOR RAIL CARS

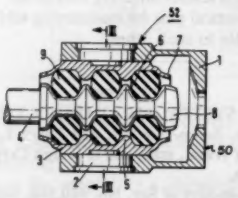
Hilmar Forster, and Wilhelm Günther, both of Wolfenbüttel, Germany, assignors to Scharfenbergkupplung GmbH, Germany

Filed Jan. 19, 1978, Ser. No. 870,633

Claims priority, application Fed. Rep. of Germany, Jan. 19, 1977, 2701984

Int. Cl.² B61G *9/06*

U.S. Cl. 213—40 R **3 Claims**



1. An elastic central buffer coupling for two rail cars, comprising a bearing housing adapted to be connected to one of the rail cars and having at least one end with a coupling rod receiving opening, said housing having an interior wall with a plurality of axially spaced radially inwardly extending annular housing cam surfaces, a coupling rod adapted to be connected to the other of the rail cars and having an end extending into said housing with a plurality of radially extending axially spaced annular coupling rod cam surfaces of substantially the same axially spacing as said housing cam surfaces, and a plurality of rings engaged on said coupling rod between said coupling rod cam surfaces with respective ones having outer peripheries bearing on said housing between adjacent housing cam surfaces, said housing interior wall and said coupling rod having an oval cross-section, said rings being held in spaced axial relationship by said coupling rod cams wherein said housing comprises two mirror-image half-shells joined together and detachable bolt means connecting said half-shells together.

4,136,788

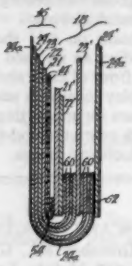
DUNNAGE BAG END CLOSURE

James A. Robbins, Covington, Tenn., assignor to Signode Corporation, Glenview, Ill.

Filed Apr. 1, 1977, Ser. No. 783,675

Int. Cl.² B65G *1/14*; B65D *57/00*

U.S. Cl. 214—10.5 D **2 Claims**



1. A four-ply dunnage bag having a first wall and a second wall and having a folded closure at one end of the bag wherein each ply of the first wall has an extension flap, said first and second walls each having an innermost first ply and second through fourth plies arranged consecutively therefrom, the flap on the first ply of the first wall folded over the end of the bag and secured to the exterior surface of the second ply of the second wall, the flap on the second ply of the first wall folded over the end of the bag and secured to the exterior surface of the folded over flap on the first ply, the flap on the third ply of the first wall folded over the end of the bag and secured to the exterior surface of the third ply of the second wall, and the flap on the fourth ply of the first wall folded over the end of the bag and secured to both the interior surface of the fourth ply of the second wall and the outer surface of the folded over flap on said third ply.

4,136,789

CONVEYING, STORAGE AND SORTING SYSTEM FOR LARGE METAL SHEETS, PARTICULARLY FOR USE IN SHIPBUILDING

Johan H. Mulock Houwer, Middelburg, Netherlands, assignor to B.V. Koninklijke Maatschappij "De Schelde", Vlissingen, Netherlands

Filed Mar. 15, 1977, Ser. No. 777,668

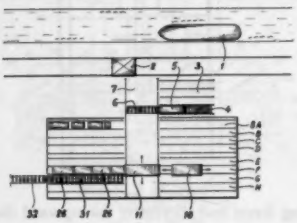
Claims priority, application Netherlands, Mar. 16, 1976, 7602745

Int. Cl.² B65G *63/04*

U.S. Cl. 214—16 B **4 Claims**

1. A conveying and storage system for sheet material and the like, which comprises a plurality of parallel rails positioned each with an end located along a predetermined transfer path and defining a corresponding plurality of elongated sheet storage passages, each passage extending lengthwise from said transfer path between a respective pair of said rails; a first vehicle moveable along said transfer path; a second vehicle carried by said first vehicle, said second vehicle being moveable between said first vehicle and a pair of said rails corresponding to a selected storage passage, said second vehicle

being moveable upon and along said pair of rails to carry sheet material between the selected storage passage and said first vehicle; and lifting means carried by said second vehicle and operable to engage and support sheet material to be carried thereby, said lifting means including grippers moveable vertically relative to the second vehicle to lift sheet material in the selected storage passage upwardly for carrying, and to lower



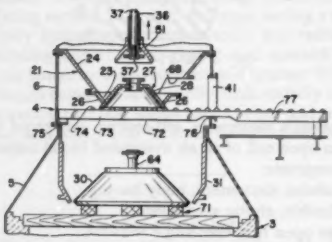
sheet material carried to deposit same in the selected storage passage; a support platform carried by said second vehicle for supporting sheet material, said support platform being vertically moveable relative to said second vehicle and detachable therefrom to allow said support platform to be stationed at a given location to receive sheet material carried from elsewhere by said second vehicle and deposited thereby on said support platform at said location.

4,136,790

CHARGING APPARATUS WITH REMOVABLE BELL

Andrejs Berzins, Parma, Ohio, assignor to Arthur G. McKee & Company, Independence, Ohio

Filed Oct. 26, 1977, Ser. No. 845,636
Int. Cl.[2] F27B *11/12*
U.S. Cl. 214—36 **16 Claims**



1. Apparatus for charging particulate material into a receptacle comprising a housing at the upper portion of said receptacle; a hopper within said housing adapted to receive particulate material, said hopper comprising a lower hopper portion removably fixed to means for supporting said hopper portion and providing an opening in said hopper portion through which particulate material may leave said hopper; a bell movable in an upright path between a hopper closing position in which it substantially closes said opening against discharge of charge material from said hopper and a hopper opening position in which it opens said opening to permit discharge of charge material from said hopper; means for supporting and moving said bell in said upright path; means providing an opening in said housing at a location in lateral alignment with said bell and said lower portion of said hopper when said bell is in said hopper closing position, said means including removable closure means adapted to close said opening in gas tight relation; and means permitting said bell to be disconnected from said bell-supporting means to permit lateral movement of said bell and said lower portion of said hopper out of said enclosure through said enclosure opening means when said enclosure opening means is opened.

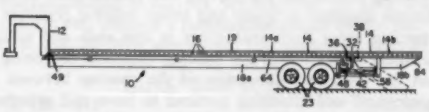
12. The method of changing a bell and associated hopper portion in a charging apparatus that includes an enclosure in which the bell is movable in an upright path relative to a hopper portion having an opening between a bell position in which the bell is spaced from said opening to permit charge material to pass out of said hopper portion and a position in which the bell substantially closes said hopper portion, and in which the bell is supported and so moved by a bell rod, which method comprises forming an opening at a side location in which said opening is substantially aligned with said bell and said hopper portion when said bell is in said hopper closing position, placing temporary supporting means to temporarily suport said bell and said hopper portion in said enclosure while said hopper portion surrounds said bell; disconnecting said bell from its bell rod and said hopper portion from its supporting means, and moving said bell and said hopper portion laterally out of said enclosure through the said opening.

4,136,791

TILTABLE VEHICLE LOADING RAMP

Gary E. Clark, Simpsonville, Ky., assignor to Maurice L. Miller, Jr., Louisville, Ky., a part interest

Continuation of Ser. No. 673,146, Apr. 2, 1976, Pat. No. 4,023,852. This application Mar. 2, 1977, Ser. No. 773,519
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.
Int. Cl.[2] B65G *67/02*
U.S. Cl. 214—85 **3 Claims**



1. A loading ramp assembly for a load carrying vehicle such as a truck, trailer and the like comprising

a stationary forward load carrying portion,

a tiltable rear load carrying portion forming a loading ramp and being pivotally attached to said forward portion,

first restraining arm supporting means suspended beneath said forward portion,

second restraining arm supporting means suspended beneath said rear portion,

an elongated restraining arm having a rear end portion pivotally connected to said second supporting means and a front portion projecting in a forward direction beneath said forward portion to engage said first supporting means,

means for locking said arm in a retracted position between said first and second supporting means to confine said forward and rear portions in a horizontal load carrying position, and

means for unlocking said arm from said retracted position to permit said rear portion to tilt downward from said horizontal load carrying position toward an inclined loading position thereby forcing said arm to move forward toward an extended position relative to said first supporting means, said arm being retractable rearward from said extended position as said rear portion is tilted upward from said inclined position toward said load carrying position, said unlocking means comprising

a rocker arm pivotally connected to said forward portion above a forward end portion of said restraining arm,

a lifting arm having one end pivotally connected to one end of said rocker arm and having the other end pivotally connected to said restraining arm, and

means for rotating said rocker arm relative to said forward portion for pulling said lifting arm to raise said restraining

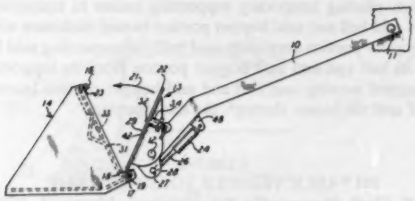
arm to thereby unlock said restraining arm from between said first and second support means.

4,136,792

QUICK ATTACHMENT DEVICE FOR A LIFTING TRACTOR

Charles D. Wilson, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Nov. 7, 1977, Ser. No. 849,082
Int. Cl.[2] E02F 3/70
U.S. Cl. 214—145 A **11 Claims**



1. A quick attachment device on a lifting tractor, comprising an implement for use in attaching to a tractor to lift material and having two spaced-apart attaching portions disposed in upper and lower relative positions and with said portions presenting confined openings faced toward each other, support arms on said tractor, a pivot pin on said support arms, an attachment member pivotly mounted on said pivot pin and extending thereabove and having two spaced-apart extension portions disposed in upper and lower relative positions and extending away from each other in free ends and with the maximum dimension of the spacing therebetween being less than the maximum dimension of the spacing between said openings of said attaching portions to have said attachment member nest into and extend between said openings of said attaching portions and be movable respectively toward and away from said attaching portions, said free ends being in snug contact in said attaching portions in the nested position, and a spring-urged fastener mechanism releasably interconnected between said implement and said attachment member and having self-fastening portions on a common axis and including a spring-urged pin and opening with their longitudinal axes disposed on said common axis and with said pin being movable into fastening position when said implement and said attachment member are nested together, and with said common axis being arranged to be automatically established when said attachment member is moved relative to said attaching portions in the aforesaid manner, for locking said attachment member to said implement.

4,136,793

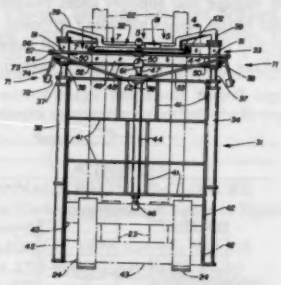
LOAD STABILIZER FOR FORKLIFT TRUCK

Joseph G. Dutra, Jr., 4568 Thornton Ave., Fremont, Calif. 94536

Filed Apr. 25, 1977, Ser. No. 790,702
Int. Cl.[2] B66F 9/18
U.S. Cl. 214—654 **11 Claims**

1. A load stabilizer for use with a forklift truck and including frame means, and top clamping means mounted to said frame means for displacement in an upward direction upon engagement with a load carried by said truck, said top clamping means being formed and being mounted to said frame means for biasing in a downward direction, wherein the improvement in said stabilizer is comprised of:

said top clamping means includes at least one leaf spring member mounted to said frame means for biasing in a downward direction under a combination of gravity and spring biasing forces, said leaf spring member being mounted to said frame means for upward displacement from its lowermost position initially solely against a gravity biasing force and thereafter for upward displacement against resilient bending of said leaf spring.

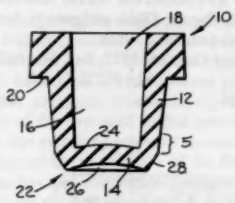


4,136,794

CANNULA PIERCEABLE, SELF-SEALING CLOSURE

Edward P. Percarpio, North Haledon, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Division of Ser. No. 729,643, Oct. 5, 1976, which is a continuation-in-part of Ser. No. 663,921, Mar. 4, 1976, abandoned. This application Feb. 23, 1978, Ser. No. 880,474
Int. Cl.[2] B65D 39/04
U.S. Cl. 215—247 **2 Claims**



1. A cannula pierceable, self-sealing, gas proof closure for sealing an open end of an air evacuated blood collection tube, which comprises;

(a) a tubular elastomeric body having

(i) flexible, elastic sidewalls;

(ii) an open first end; and

(iii) a closed second end formed by a cannula pierceable, flexible, elastic end wall integral with said sidewalls;

(b) a flange disposed radially about the periphery of said sidewalls adjacent to said first end; and

(c) a protective cap adhered to the outside of said closed second end;

said end wall having a convex inner surface and a concave outer surface when pressure on inner and on outer surfaces is equal, said tubular body having a diameter which bears a ratio to the height of the body of about 0.8:1 and to thickness of the second end of from 5.4:1 to 12.1:1;

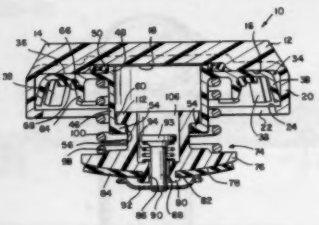
whereby when the closure is emplaced in and sealing an open end of an air evacuated tube, the higher pressure on the convex inner surface of the end wall as compared to the lower pressure (vacuum) exerting itself on the concave outer surface creates a pressure differential on the end wall, flexing and flattening the concave-convex configuration and creating a radial force directed toward the periphery of the end wall, said force effecting a restraining and sealing force between the closed second end of the elastomeric body and the air evacuated tube.

4,136,795

PLASTIC RADIATOR CAP

Billy G. Crute; Henry Ruhl, both of Connersville, and William R. Coffey, Indianapolis, all of Ind., assignors to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed Sep. 5, 1975, Ser. No. 610,652
Int. Cl.[2] B65D *51/16*
U.S. Cl. 220—203 10 Claims



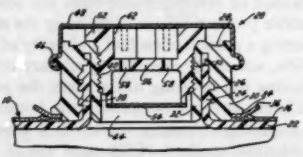
1. For a radiator filler neck of the type having a peripherally extending upper lip and, downwardly from said lip, a radially inwardly and peripherally extending, upwardly facing pressure valve seat, a cap comprising an outer shell for engaging and closing said filler neck, a molded plastic retainer connected to said outer shell, and a molded plastic pressure valve member for engaging said seat, said retainer having a peripherally and radially outwardly extending flange and a downwardly extending shank, sealing means carried by said flange for engaging and sealing against said upper lip, said valve member providing an upwardly extending shank, said shanks having interlocking portions for connecting said valve member to said retainer, spring means for yieldably urging said valve member against said valve seat, said spring means acting between said retainer and valve member to hold said interlocking shank portions in engagement, the improvement in which said shell has a peripherally depending skirt formed to provide peripherally and radially inwardly extending flange means having an upwardly facing surface, said retainer flange having a plurality of peripherally spaced apart, downwardly and radially outwardly extending fingers for engaging said upwardly facing surface of said flange means to connect said retainer within said shell, said fingers being resiliently deflectable radially inwardly to move upwardly past said flange means when said retainer is inserted into said shell, said retainer being rotatable in said shell.

4,136,796

VENTED CLOSURE

Robert A. Dubois, Marion, Ohio, and William H. Gushard, Staten Island, N.Y., assignors to Greif Bros. Corporation, Delaware, Ohio

Continuation of Ser. No. 459,970, Apr. 11, 1974, abandoned, which is a continuation of Ser. No. 270,310, Jul. 10, 1972, abandoned. This application Nov. 20, 1975, Ser. No. 633,907
Int. Cl.[2] B65D *51/16, 51/18*
U.S. Cl. 220—256 2 Claims



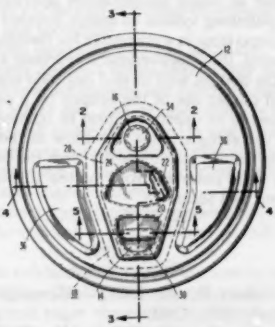
1. A molded plastic vented closure for a container having a molded plastic liner neck defining an opening comprising a plug for extending across an opening in a container, the plug including an upper end and comprising a body with a passage extending longitudinally therethrough, means on said body for connecting to the container across said opening; an integral flat disc extending across said passage longitudinally spaced apart from said upper end and having a plurality of apertures, the plug including a bottom end, and a porous relatively inert, easily damaged fluorocarbon flat cloth membrane of 3 micron-mesh fabricated from fluorocarbon filaments associated with the closure below the disc and across said passage to permit venting of gasses therethrough and out said passage through the disc apertures into the ambient and preventing passage therethrough of a liquid, the membrane extends across the plug bottom end longitudinally spaced apart from said disc and being connected to the plug bottom with the plastic of the associated surfaces of the plug penetrating the pores of the engaged surface portion of the membrane thereby providing a mechanical bond between the associated surfaces of the plug and membrane, the disc protecting the membrane from rupture, and the vented closure including a cap for coupling with the neck defining the opening of the container, the cap including an inner and outer integrally connected concentric flange both of which have internal threads, the threads of the outer flange adapted to mesh with corresponding threads on the exterior of the neck of the container, the connecting means of the plug including external threads, and the threads on the inner flange mating with threads of the plug, and a radial lip on the top of the plug for sealing with the top of the cap and preventing the plug from being threaded too far into the cap.

4,136,797

EASY-OPENING CAN END AND METHOD OF OPENING

Vinson S. Potts, Cherry Hill, N.J., assignor to Crown Cork & Seal Company, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 741,664, Nov. 15, 1976, Pat. No. 4,078,695, which is a continuation-in-part of Ser. No. 596,530, Jul. 16, 1975, abandoned. This application Oct. 20, 1977, Ser. No. 844,142
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—271 80 Claims



1. A can of the easy-opening type comprising:
a can body;
an end panel attached to said can body and having a dispensing opening communicating between the interior and the exterior of said can body; and
a closure tab pivotally attached to said end panel, said tab comprising a closure portion sealingly engaging said end panel on the interior side thereof adjacent said dispensing opening, said closure portion extending on the interior side of said end panel from said dispensing opening to the area of pivotal attachment of said tab to said end panel, said tab further comprising a finger engageable portion located on the exterior of said end panel so as to permit said closure portion to be pivoted from the closed position to the open position, said dispensing opening and said tab permitting said closure portion to be pushed inwardly so as to break the seal between said closure portion and said

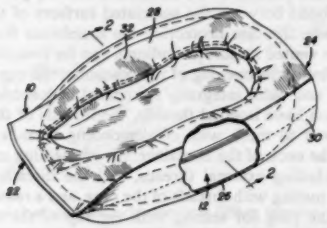
end panel during opening while said finger engageable portion remains on the exterior side of said end panel thereby facilitating subsequent pivoting of said closure tab about an axis substantially parallel to the axis of the can body.

4,136,798

FLUSHABLE BEDPAN BAG

Nathan Oberstein, 55 Knolls Crescent, Bronx, N.Y. 10463

Filed Aug. 16, 1976, Ser. No. 714,838
Int. Cl.[2] B65D *25/16, 25/34;* A61G *9/00*
U.S. Cl. 220—408 **6 Claims**



1. In an improved bag for enclosing a bedpan, emesis pan, or the like, comprising a bottom wall, top wall and side walls interconnecting the top and bottom walls to form a complete enclosure for the pan with a portion of the top wall being disposed downwardly into an opening in the top of the pan to thereby completely enclose and protect the pan from contact with a patient and excreta therefrom and to maintain the pan sterile, thereby eliminating the necessity of cleaning and sterilizing the pan after each use, at least a portion of the top wall of the bag, which portion normally contacts excreta from the patient, being formed of a material which is water-insoluble at temperatures approximating body temperature and which is water soluble at liquid temperatures approximately that of water in a plumbing system to enable disposal of the bag and excreta by depositing in a commode for flushing into a sewage disposal system, the improvement comprising a separable seam formed in the bottom wall of said bag, said seam being closed prior to and during use of the bedpan by a patient, the seam being adapted to be opened to form an opening in the bottom wall of the bag along said seam to allow the bottom wall to be displaced outwardly and upwardly from the bedpan to enable the bedpan to be removed from the bag through the opening formed along said seam.

4,136,799

DECANTER

Kenneth J. Albert, Beverly Hills, Calif., assignor to Inventor's Inc., Beverly Hills, Calif.

Filed Sep. 26, 1977, Ser. No. 836,382
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—415 **15 Claims**

1. In a decanter for liquids from which gas emanates, an open-top cylindrical receptacle, a cover detachably mounted on said receptacle at its open top with a sealing fit, said cover including a generally vertical side wall defining a passageway confined by the perimetric boundary of said side wall, said side wall traversed by a top wall to completely block passage through said passageway, said top wall having a drinking opening and a gas relief vent, and an improved operating unit controlling opening and closing of said drinking opening and said vent, said operating unit comprising:

(a) a bar positioned on the underside of said top wall and generally parallel thereto;

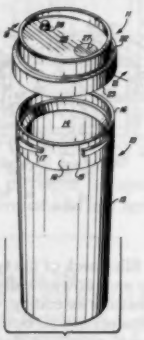
(b) a valve member for said drinking opening on one end of said bar;

(c) a pushbutton on the other end of said bar and received through said vent, said pushbutton being disposed at an angle relative to said bar which is slightly less than 90 degrees on the side adjacent to the end of the bar;

(d) an O-ring about said pushbutton and engageable with the underface of said top wall to close said vent;

(e) a leaf spring having one end secured to said bar at the end having the pushbutton; and

(f) means for connecting the other end of said spring to the underface of said top wall; said pushbutton being loosely



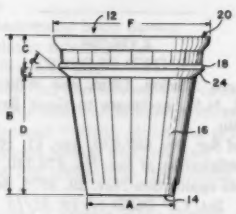
positioned in said vent when said O-ring and said valve member for the drinking opening are in fully closed position; whereby upon partial depression of the pushbutton the latter engages the side of said vent closest to the end of said bar to constitute said side a fulcrum about which the pushbutton swings on further depression of the pushbutton to move said O-ring and valve member into open positions.

4,136,800

DISPENSED CONE COVERING AND METHOD OF VENDING

Willis D. Christner, Florence, Ky., and Howard J. Ortman, Cincinnati, Ohio, assignors to The Kroger Company, Cincinnati, Ohio

Filed Aug. 16, 1977, Ser. No. 825,149
Int. Cl.[2] B65G *59/00;* A21D *13/00*
U.S. Cl. 221—1 **16 Claims**



1. A method of vending edible open top cones adapted to receive edible product therein comprising the steps of

(a) covering a portion of each of a plurality of cones with an inedible, non-toxic, close-fitting sanitary covering,

(b) adhering the covering to the cone, the portion of each cone being covered comprising the bottom of the cone and extending upwardly therefrom a grasping distance, and terminating short of the open top of the cone, said adhering accomplished by providing a plurality of generally longitudinally extending ribs in said covering, said ribs facilitating interfering engagement between said covering and said cone portion,

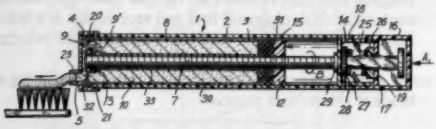
(c) disposing said cones in a nested stack, one above the other, and

(d) automatically dispensing said cones substantially one at a time from said stack to a product-filling area.

4,136,801
REPLACEABLE CARTRIDGE FOR A DISPENSER

Stanford Pavenick, 341 Scotland Rd., South Orange, N.J. 07079

Filed Dec. 9, 1977, Ser. No. 859,153
Int. Cl.[2] B65D *35/30, 35/56*
U.S. Cl. 222—82 12 Claims

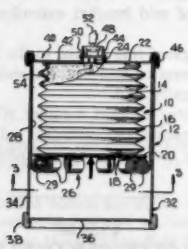


1. In a dispenser, a combination comprising:
a. an elongated container having a discharge outlet at one end of said container;
b. means for expelling material to be dispensed through said discharge outlet, including
a shaft extending from the other end of said container towards said one end of the latter,
a compression element mounted on said shaft for movement lengthwise of the latter, and means for moving said compression element from said other end towards said one end of said container; and
c. a replaceable collapsible envelope for containing the material to be dispensed, said envelope surrounding said shaft and being located in said container intermediate said discharge outlet and said compression element, said envelope having an openable portion adjacent said discharge outlet to thereby permit escape through the latter of the material contained in said envelope in response to collapse of the latter upon movement of said compression element towards said one end of said container.

4,136,802
SPRAY DISPENSER WITH SPRING BIASED FLEXIBLE CONTAINER

Carmen T. Mascia, Clarendon Hills, and Gary K. Hasegawa, Chicago, both of Ill., assignors to The Continental Group, Inc., New York, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,350
Int. Cl.[2] B65D *35/28;* B05B *11/02*
U.S. Cl. 222—95 10 Claims

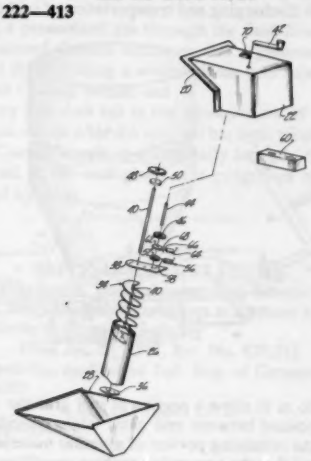


1. A dispensing unit for a container, said dispensing unit comprising a readily collapsible container having a bottom wall, and a spring mechanism engageable with said bottom wall, said spring mechanism including a plurality of spring strips each inherently urged towards a rolled condition, said spring strips being spaced about the exterior of said container and extend along the axial length of said container terminating in lower end portions underlying said bottom wall.

4,136,803
METHOD AND MECHANISM FOR CONVERSION OF FREE ACCESS ICE CHESTS TO PROVIDE CONTROLLED DISPENSING OF ICE

Lamar K. Tobias, 615 N. Lakeview Apt 101, Sturgis, Mich. 49091, and Jerry J. Motyka, Detroit, Mich., assignors to Lamar K. Tobias, Sturgis, Mich.

Filed May 31, 1977, Ser. No. 801,534
Int. Cl.[2] B65G *33/20*
U.S. Cl. 222—413 10 Claims



1. A method of converting a free access ice chest to a limited access ice chest of the type including a housing enclosing a storage bin for containing bulk quantities of ice, and an access door located over an access opening communicating with the storage bin, the method including the steps of:
mounting a lift conveyor mechanism to said access door, said lift conveyor thereof extending downwardly into said storage bin and including:
a tubular housing extending into said ice chest;
an auger element disposed within said tubular housing and mounted for rotation therein, said tubular housing having openings at either end, one of said openings adapted to receive said ice at said end disposed in said storage bin and said other opening allowing dispensing therethrough of ice at the other end of said tubular housing produced by rotation of said auger element;
locking said access door to prevent opening thereof; installing a handle enabling manual rotation of said auger element;
controlling the rotation of said auger element by said handle by controllably releasing said auger element for rotation and locking said auger element against rotation, whereby the quantity of ice dispensed by rotation of said handle may be metered;
whereby limited access to said storage bin is provided by controlled operation of said lift conveyor mechanism.

4,136,804
GRAVITY MOTIVATED HOPPER

Raymond C. Kinzler, Carnegie, and Harry R. Bartlebaugh, Gibsonia, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

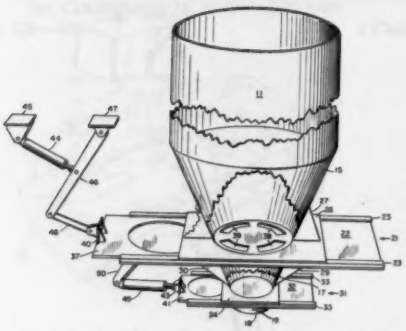
Filed Mar. 28, 1978, Ser. No. 891,013
Int. Cl.[2] B65G *65/70*
U.S. Cl. 222—547 3 Claims

1. A gravity motivated hopper movable from one location to another, to alleviate the propensity for hopper-contained granular material to compact and arch in the critical arching dimension of said hopper, comprising:
(a) a hopper with a hollow interior having a bottom section

vertically oriented with vertically decreasing cross-section areas defining a discharge flow path leading to a bottom opening;

(b) first gate means for closing said opening while said hopper is being charged with granular material and during transport of said material to a discharge location;

(c) second gate means spaced above such first gate means so that said critical arching dimension is between said gates, said second gate means incompletely closing said hopper during the discharging and transportation of said granular



material so as to allow a portion of said granular material to be deposited between said gates while providing support for the remaining portion of granular material in said hopper and thereby preventing arching conditions of said granular material from developing in said critical dimension area; and

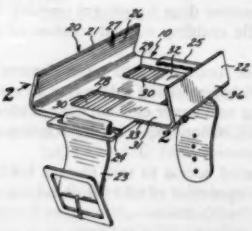
(d) means for slidably motivating said second gate means to a discharge position for allowing unobstructed flow through said second gate means during discharge of said granular material from said bottom opening.

4,136,805

WRIST BAND HOLDER FOR ELECTRONIC CALCULATOR

William L. Storms, Costa Mesa, Calif., assignor to Alpha Nova Development Corp., Santa Ana, Calif.

Filed Jul. 1, 1977, Ser. No. 812,108
Int. Cl.² A45F *5/00*
U.S. Cl. 224—28 R **2 Claims**



1. A securing device deployable on the arm of a person for securing electric calculators and the like comprising:

bracket means including a first bracket half formed as an L-shaped surface having a first and second slot respectively proximate the transverse edges thereof, said L-shaped surface comprising a substantially rectangular plate joined to a first planar lip along one longitudinal edge thereof, the alignment of said lip relative said plate being at an acute angle in partial overlap over said plate, a second bracket half comprising a plurality of tongue members joined at an acute angle to a second partly overlapping planar lip, said plate including a corresponding set of planar transversely aligned recesses, each conformed to the planar form of a corresponding one of said tongues, the adjacent surfaces of said tongues and said recesses each including mating ribs for providing engagement therebetween, said first and second lips each include longitudinal serrations formed on the opposed surfaces thereof, said ribs comprise longitudinally aligned elongate projections having a triangular section, the apex of each rib being biased to allow insertion of said tongues into said recesses and to oppose withdrawal therefrom, whereby said first and second halves are alignable to mate said tongues and said recesses at various spacings relative to each other to deploy said first and second lips in a deforming and frictional fit around the edges of said calculator; and

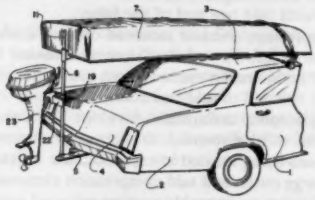
strap means insertable through said slots for securing said bracket means to a person.

4,136,806

OUTBOARD MOTOR CARRIER

Adam Wisz, 2231 W. 60th Dr., Merrillville, Ind. 46410

Filed Dec. 8, 1977, Ser. No. 858,695
Int. Cl.² B60R *9/08*
U.S. Cl. 224—42.45 R **1 Claim**



1. An outboard motor carrier for an automotive vehicle having a chassis and a body mounted on the chassis and having a top and a rear, said outboard motor carrier comprising

a support member affixed to the chassis of an automotive vehicle and extending substantially horizontally beyond the rear of the body;

a support post mounted on the support member beyond the rear of the body of the vehicle and extending substantially vertically beyond the top of the vehicle for supporting a boat resting on said top;

a substantially square U-shaped bracket having first and second spaced parallel arms;

fastening means affixing the first arm of the bracket to the support post in substantial juxtaposition therewith at an area intermediate the support member and the top, the second arm of said bracket extending rearward of said support post;

a flattened elongated ring affixed to the free ends of the first and second arms of said bracket and extending substantially horizontally; and

a board-like motor support member affixed to the second arm of said bracket and extending substantially vertically from said ring for supporting an outboard motor mounted thereon.

4,136,807

METHOD OF OPENING SCORE LINES IN GLASS SHEETS

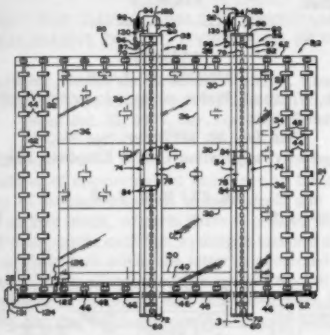
Robert P. DeTorre, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 690,337, May 26, 1976. This application Aug. 24, 1977, Ser. No. 827,201
Int. Cl.² C03B *33/02*
U.S. Cl. 225—2 **18 Claims**

1. A method of severing a sheet of fracturable material having at least one score line extending between a first edge

and opposed second edge which edges are transverse to the direction of advance, comprising the steps of:

advancing the scored sheet along an article movement path into a snapping position;



engaging the sheet between the first and second edges with bending moment applying means; and

displacing the bending moment applying means transverse to the article movement path to open the at least one score line.

4,136,808

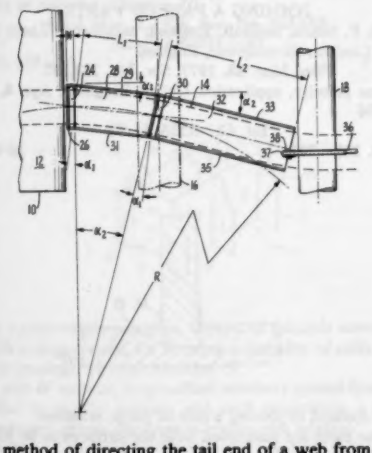
WEB THREADING SYSTEM

Imants Reba, Vancouver, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Nov. 21, 1977, Ser. No. 853,692

Int. Cl.² B65H *17/32*

U.S. Cl. 226—7 **7 Claims**



6. A method of directing the tail end of a web from a first location to a second location laterally offset from said first location comprising:

positioning a first Coanda nozzle having an elongated fluid flow exit slit between said first and second locations;

flowing a pressurized gas through the fluid flow exit slit of said first Coanda nozzle so that a gaseous flow is induced thereby along a bottom wall adjacent to said first Coanda nozzle;

operatively engaging said web tail and the gaseous flow induced by said first Coanda nozzle; and

propelling said web tail with said gaseous flow so that said web tail engages a side wall projecting from said bottom wall and positioned at a first predetermined angle of displacement relative to said first Coanda nozzle elongated fluid flow exit slit, whereby said gaseous flow and said web tail impinge against said side wall and said web tail is laterally displaced in the web plane said first predetermined angle of displacement as it is propelled toward said second location by said gaseous flow;

positioning a second Coanda nozzle having an elongated fluid flow exit slit between said first Coanda nozzle and said second location with said second Coanda nozzle slit angularly displaced relative to said first Coanda nozzle slit;

flowing a pressurized gas through the fluid flow exit slit of said second Coanda nozzle so that a gaseous flow is induced thereby along a second planar wall adjacent to said second Coanda nozzle; and

entraining said web tail in the gaseous flow of said second Coanda nozzle after the web tail has been propelled by the first Coanda nozzle to additionally laterally displace said web tail in the web plane as it progresses towards said second location.

4,136,809

PAPER TRANSPORT DEVICE

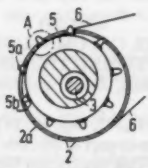
Gottfried Engelmann, Irschenhausen, and Guenter Christoph, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 29, 1977, Ser. No. 820,215

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636387

Int. Cl.² B65H *17/38*

U.S. Cl. 226—79 **9 Claims**



1. A paper transporting device comprising a platen having tubular end portions with circumferentially spaced apart slots therethrough, pin wheels received within said tubular end portions having radially extending circumferentially spaced pins, and eccentric mounts for said pin wheels, said eccentric mounts effective to position the pin wheels with respect to the platen such that pins project through said slots for only a portion of the circumference of the platen, said pins having a radial dimension sufficient to engage side margin perforations in a paper received around said platen, the slots have circumferentially spaced apart axially extending walls parallel to the platen axis, the pin wheel having projecting teeth portions having circumferentially spaced axially projecting walls dimensioned to be received in said slots, at least some of said teeth portions projecting into at least some of said slots, pins formed on radial end portions of the teeth and projecting radially therebeyond, the teeth having a radial dimension sufficient to project into the slots but insufficient to project beyond the platen surface.

4,136,810

AUTOMATIC NAILER GUN AND MAGAZINE

William T. Bull, Oxnard, Calif., assignor to Advance Nailing Tools, Inc., Santa Paula, Calif.

Filed Oct. 27, 1977, Ser. No. 845,820

Int. Cl.² B25C *1/04*

U.S. Cl. 227—120 **27 Claims**

1. An improved automatic, hand-held nailer comprising:

(a) a gun selectively operable by an operator and having

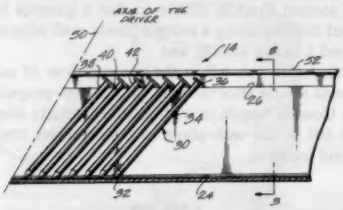
driver means for impacting the head of a nail with sufficient force to set the nail;

(b) a driver head having a chamber for receipt of a nail of a predetermined size and passage of the driver means into the chamber to impact the head of a nail there;

(c) means to hold the nail in the chamber and for releasing the nail when the driver means impacts the nail; and

(d) magazine means for storing a plurality of nails and to sequentially feed the nails into the chamber, the magazine means including:

(i) nail head support means to support the head of a nail,



(ii) nail point support means to support the points of the nails, and

(iii) the nail head and point support means being oriented at an angle to the horizontal and having a distance between them shorter than the distance between the nail head and the point of the nails to be used in the magazine so that the nails orient in echelon fashion, with each nail head overlapping the head of the nail immediately preceding it and engaging the shaft of the nail immediately following it.

4,136,811

H-SHAPED STEEL COLUMN BASE MEMBER AND WELDING THEREOF

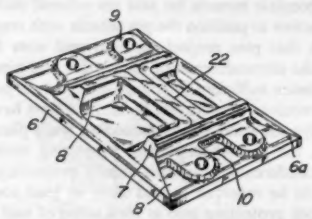
Kuniaki Sato, Hiratsuka, Japan, assignor to Kajima Corporation, Tokyo, Japan

Division of Ser. No. 613,347, Sep. 15, 1975, Pat. No. 4,068,436, which is a continuation-in-part of Ser. No. 387,166, Aug. 2, 1973, Pat. No. 4,048,776. This application Oct. 31, 1977, Ser. No. 847,266

Claims priority, application Japan, Aug. 21, 1972, 47/82799; Aug. 21, 1972, 47/82800

Int. Cl.² B23K 31/02

U.S. Cl. 228—165 **3 Claims**



1. A method of connecting an H-shaped steel column member to a base plate member, wherein said base plate member comprises a substantially planar bottom plate portion, a projection extending from the planar bottom plate portion and having a top surface whose shape is substantially identical to cross sectional shape of the steel column member, a web part of a top surface of said projection having a width broader than that of a web of column member, J-shaped welding grooves formed along both edges of said top surface of said projection facing to lower ends of flanges of said column member, the improvement characterized by, the steps of placing the lower end surface of said column member onto said top surface of said base plate member in a desired relation, effecting fillet welding along between lower ends of said web of the column member and said top surface of said base plate member, and effecting J-shaped groove welding along said J-shaped grooves of said base plate member between bottom surfaces of said flanges of the column member and said grooved surfaces of said base plate member.

4,136,812

JOINING METALS

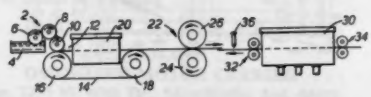
John Bellis, Wrexham, Wales, assignor to British Steel Corporation, Great Britain

Filed Jan. 31, 1977, Ser. No. 764,206

Claims priority, application United Kingdom, Jan. 30, 1976, 3766/76

Int. Cl.² B22F 3/00

U.S. Cl. 228—175 **14 Claims**



1. A method for securing green metallic strip produced from metal powder to means by which a strip end may be guided along a selected path, the method consisting of interposing between overlapping regions the means and the strip end an aqueous composition having a water content which can be absorbed by the strip to an extent sufficient to enable the composition to provide adequate adhesion for support and/or guidance.

13. A method as claimed in claim 1 wherein the strip and the guide means move with substantially matched velocities during bonding by the aqueous composition.

4,136,813

JOINING A PAIR OF PARTS

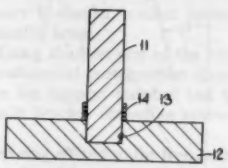
Norman F. Smith, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 28, 1977, Ser. No. 782,257

Claims priority, application United Kingdom, Apr. 6, 1976, 13815/76

Int. Cl.² B23K 31/02

U.S. Cl. 228—224 **16 Claims**



1. A method of joining a pair of parts, wherein:

(a) the parts are assembled with the surfaces to be joined in the required joining position, one of the parts being formed of a material containing free carbon and the other part being formed of a metal at least at its surface to be joined to said one part,

(b) a brazing material and a flux are provided at or adjacent said surfaces to be joined, the flux when raised to an elevated temperature above the melting point of the brazing material, being capable of reacting with oxides and carbon at the surface of said one part, and the brazing material being capable of being heated to said elevated temperature without decomposition, and

(c) the assembly is heated at least to said elevated temperature in a non-oxidizing atmosphere so as to melt the brazing material and cause the flux to react with surface oxides

and carbon on said one part whereby, on cooling, a brazed joint is produced between the parts.

4,136,814

METHOD FOR IMPROVING THE RESISTANCE TO EMBRITTLEMENT DUE TO HYDROGEN IN WELDED JOINTS

Mario Sarracino, Rome, and Arduino Lannaioli, Vasanello (Viterbo), both of Italy, assignors to Italsider S.p.A., Italy

Filed Jul. 22, 1977, Ser. No. 818,339
Int. Cl.[2] B23K *35/30*
U.S. Cl. 228—263 **4 Claims**

1. A method of improving the resistance to hydrogen embrittlement of welded joints in carbon steels and low-alloy structural carbon steels, wherein there is created in the weld zone a galvanic couple such that hydrogen ions are discharged onto the welded seam while the latter is protected from the hydrogen action by alloying with a metal selected from the group consisting of chromium and molybdenum; which comprises using for the welding operation a steel welding wire containing nickel and a metal selected from the group consisting of chromium and molybdenum; the nickel content of said wire being related to the nickel content of the steel to be welded according to the following expression:

$$\%Ni_{base\ metal} + 0.40\% < \%Ni_{wire} < \%Ni_{base\ metal} + 1.0\%$$

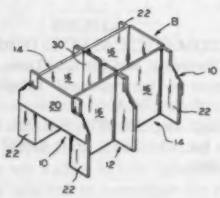
and the chromium content of said wire if present being between 1.5 and 5 times the nickel content of the wire, and the molybdenum content of the wire if present being between 0.15 and 0.50 times the nickel content of the wire.

4,136,815

CONVERTIBLE PARTITION ARRANGEMENT

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Mar. 3, 1978, Ser. No. 883,055
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—15 **4 Claims**



1. In a convertible partition, formed of foldable sheet material such as paperboard, for forming a plurality of cells within an outer package, the combination of:

(a) a pair of vertical, longitudinal members spaced from each other in parallel relation and each comprising a pair of co-planar panels disposed in end-to-end relation;

(b) a pair of vertical end transverse members spaced from each other in parallel relation at opposite ends of said partition;

(c) a vertical center transverse member located intermediate and parallel to said end transverse members;

(d) each of said transverse members comprising:

(i) a major panel extending outboardly beyond said longitudinal members;

(ii) a pair of minor panels located outboardly of said longitudinal members;

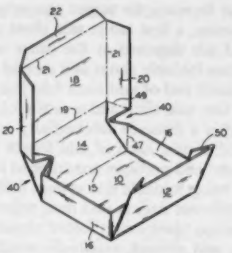
(iii) said minor panels having inner edges foldably joined to adjacent side edges of related longitudinal member panels on vertical fold lines and having outer edges foldably joined to adjacent upper edges of said major panel on inclined fold lines.

4,136,816

SELF LOCKING CONTAINER

Jeffrey M. Gardner, Wheaton, Ill., assignor to Container Corporation of America, Chicago, Ill.

Filed Jan. 3, 1978, Ser. No. 866,481
Int. Cl.[2] B65D *5/08, 5/02*
U.S. Cl. 229—33 **2 Claims**



1. A self-locking container, formed of a unitary blank of foldable paperboard, comprising:

(a) a pair of top and bottom walls interconnected by a rear wall foldably joined at its upper and lower edges to rear edges of said top and bottom walls;

(b) a front wall foldably joined at its lower edge to a front edge of said bottom wall;

(c) opposed pairs of upper and lower side wall panels foldably joined to opposed side edges of said top and bottom walls;

(d) opposed pairs of front and rear bellows members foldably joining said side wall panels to said front and rear walls;

(e) said rear bellows members also foldably joining said upper side wall panels to said lower side wall panels at the rear of said container;

(f) a closure flap foldably joined to and depending from a front edge of said top wall;

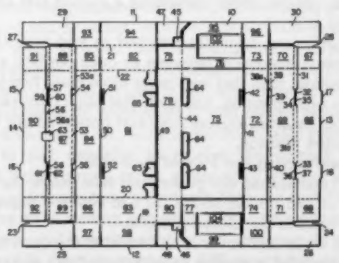
(g) said front bellows members forming with said front wall a pocket for receiving said closure flap to provide interlocking means for closing said container.

4,136,817

VARIABLE-SIZE CARTON BLANK

Gerald E. Perry, Martinsville, Va., assignor to Southeast Container Corporation, Martinsville, Va. and Willis H. White, Salisbury, N.C.

Filed Jan. 18, 1978, Ser. No. 870,568
Int. Cl.[2] B65D *5/66, 5/22*
U.S. Cl. 229—33 **18 Claims**



1. A carton blank comprising a rectangular sheet of foldable material having spaced parallel first edges and spaced parallel second edges at right angles thereto, first spaced tabs extending from each of said second edges, first, second and third spaced parallel fold lines parallel to each of said second edges in said

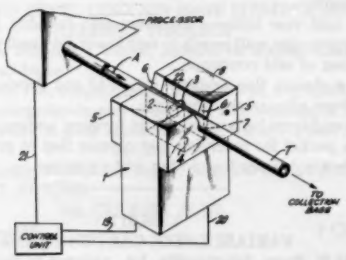
sheet, second spaced tabs in each of said first fold lines, first spaced slots in each of said second fold lines to receive said first spaced tabs, second spaced slots adjacent to said third fold lines to receive said second spaced tabs, fourth and fifth spaced parallel fold lines in said sheet parallel to each of said first edges, a sixth fold line in said sheet parallel to said second edges forming the rear bottom edge of the completed carton, a seventh fold line in said sheet spaced from and parallel to said sixth fold line forming the upper rear edge of the top of the completed carton, a first tab in said sheet disposed at one end and a second tab disposed at the other end of each of said fourth fold lines foldable about said second fold line and tabs in said sheet at each end of said sixth fold line foldable about said seventh fold line, said sixth and seventh fold lines being spaced from each other a distance substantially equal to the depth of the completed carton, each of said fourth fold lines including first and second end portions conditioned to be separated, said carton blank being foldable into at least first and second configurations of different size, in said first, relatively large configuration said carton blank being folded about its first and second fold lines, in said second, relatively small configuration said blank being folded about said first, second and third fold lines and said first and second end portions being separated to form larger first and second tabs.

4,136,818

LIGHT-SHIELDING TUBE HOLDER FOR USE WITH BLOOD WASHING APPARATUS

Edward W. Larrabee, Bronxville, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Oct. 25, 1977, Ser. No. 845,299
Int. Cl.[2] B04B *15/12*
U.S. Cl. 233—1 R **6 Claims**



1. A device for holding a transparent tube in the optical path of a first slot in a top surface of an optical sensor for detecting the amount of light passing through said tube and for shielding light from external sources from said optical sensor comprising:

(a) an opaque cover containing a second slot for receiving said tube,

(b) said cover pivotally attached to said optical sensor for limited movement between an open position and a closed position, such that said cover blocks said first slot when in the open position, and such that said cover excludes light from external sources from said optical sensor when in the closed position,

(c) said second slot located such that:

(1) said second slot pushes said tube below the top surface of said optical sensor, as said cover is moved from the open to the closed position,

(2) while said cover is moved from the open to the closed position, a portion of said second slot always coincides with a portion of said first slot, forming an opening large enough for said tube, and

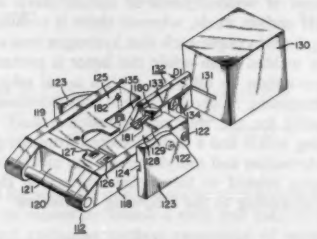
(3) when said cover is in the closed position, a portion of said second slot coincides with the optical path of said first slot thereby holding said tube in place and shielding said optical sensor from light from external sources.

4,136,819

CARD PROCESSING APPARATUS

Tomohiko Torita, Chichibu; Toru Okada, Kumagaya, and Yuji Yokota, Chichibu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, Saitama, both of, Japan

Filed Sep. 27, 1976, Ser. No. 726,753
Claims priority, application Japan, Sep. 29, 1975, 50-117523; Oct. 8, 1975, 50-121503; Oct. 17, 1975, 50-125105; Oct. 21, 1975, 50-126554; Oct. 21, 1975, 50-126555; Oct. 21, 1975, 50-126556; Nov. 10, 1975, 50-134841
Int. Cl.[2] G06K *7/02, 1/20, 7/08, 13/00*
U.S. Cl. 235—431 **47 Claims**



1. A card processing apparatus comprising:

a housing having an opening therein;

card carrying means movably disposed within said opening of said housing and having a card rest portion on which a card having information recorded thereon may rest;

reader means disposed within said housing for reading the recorded information from said card;

transport means for transporting said card on said card rest portion to said reader means by said card carrying means being moved within said opening and inwardly of said housing; and

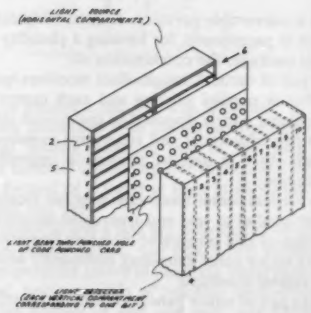
guide means disposed between said card carrying means and said reader means for guiding said card between said two means.

4,136,820

AUTOMATIC CALLING DIRECTORY

Juan Collado, Bayamon, and Enrique Leon, Rio Tiedras, both of P.R., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Aug. 15, 1977, Ser. No. 824,373
Int. Cl.[2] G06K *7/10;* G08C *9/06*
U.S. Cl. 235—460 **26 Claims**


LIGHT SOURCE
(HORIZONTAL COMPARTMENTS)
LIGHT BEAM THRU PUNCHED HOLE OF CODE PUNCHED CARD
LIGHT DETECTOR
(EACH VERTICAL COMPARTMENT CORRESPONDING TO ONE BIT)

1. A reader for a code punched card comprising:

a first portion including

a first plurality of compartments having a given orientation,

a single first means to emit light disposed in each of said first plurality of compartments, and

second means completely lining all walls of each of said first plurality of compartments to diffuse light emitted by said single first means throughout an associated one of said first plurality of compartments; and

a second portion including

a second plurality of compartments having an orientation orthogonal to said given orientation,

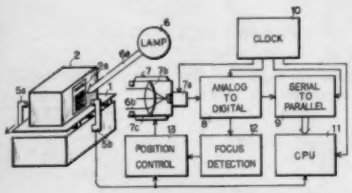
a single third means to detect light disposed in each of said second plurality of compartments, and

fourth means completely lining all walls of each of said second plurality of compartments to reflect said diffused light passing through said card to said single third means in all of said plurality of second compartments receiving said diffused light.

4,136,821
METHOD AND APPARATUS FOR RECOGNIZING CODE INFORMATION

Akio Sugiura, Nagoya; Atutoshi Okamoto, Toyohashi, and Tadao Nojiri, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 25, 1977, Ser. No. 818,669
Claims priority, application Japan, Sep. 1, 1976, 51-104398
Int. Cl.[2] G06K *7/14*; G03B *7/08*; G06K *5/00*
U.S. Cl. 235—462 **5 Claims**



1. A system for recognizing code information comprising:

a light source for supplying illumination light on an object on which code information is recorded by a combination of two different bar widths in two light reflective colors;

a converging lens adapted to converge the reflected light produced by said code information;

means for producing clock pulses;

an image sensor comprising a plurality of light response elements each optically coupled with said converging lens and driven one by one in a direction transverse to the bar extending direction for receiving said reflected light through said converging lens and producing an image signal which has a signal level changing in accordance with the density of said reflected light;

means for sampling said image signal in synchronization with said clock pulses to thereby produce continuous analog signals;

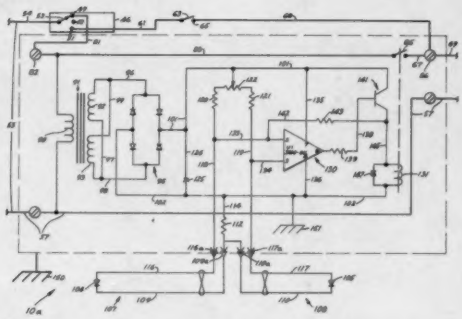
a focus detection circuit, connected to said image sensor, for detecting the level change of said continuous analog signal and producing a deviation signal when the detected value of said level change is less than a predetermined reference value; and

distance control means, connected to said focus detection circuit, for controlling the distance between said converging lens and said image sensor in response to said deviation signal.

4,136,822
APPARATUS AND METHODS FOR CONTROLLING FAN OPERATION

John V. Felter, P.O. Box 7464, Houston, Tex. 77008

Continuation-in-part of Ser. No. 711,738, Aug. 5, 1976, abandoned, which is a continuation-in-part of Ser. No. 597,495, Jul. 21, 1975, abandoned. This application Jul. 21, 1977, Ser. No. 817,612
Int. Cl.[2] F24F *7/06*
U.S. Cl. 236—49 **3 Claims**



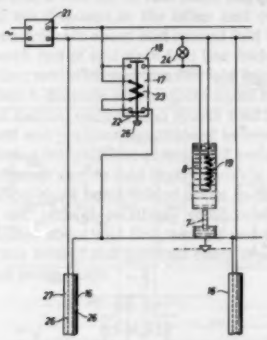
1. Apparatus for controlling the operation of electrically driven ventilator means in response to the difference in temperature between first and second locations, comprising an electric switch for controlling operation of said ventilator means, a first temperature responsive diode for sensing the temperature at said first location and a second temperature responsive diode for sensing the temperature at said second location, means for operating said switch in response to temperature differences between said first and second locations to start said ventilator means in operation when the difference in the temperatures between said first and second locations exceeds a small predetermined temperature difference and to stop operation of said ventilator means when the difference in the temperatures between said first and second locations does not exceed said small predetermined temperature difference, said operating means comprising an electrical bridge circuit having first and second input terminals, a direct current electrical source, means connecting said source to said first and second input terminals, said bridge circuit including a pair of parallel branches connected between said first and second input terminals each having an intermediate juncture point and each having a fixed resistor between said juncture point and said first input terminal, said first and second temperature responsive diodes being disposed one in each of said branches between said juncture points and said second input terminal, an integrated circuit differential amplifier serving as a voltage comparator connected between said juncture points and serving to amplify voltage differences caused by temperature differences at said diodes at said first and second locations, a transistor connected to said source and connected to said amplifier to receive the voltage output thereof and being turned on in response to voltage outputs resulting from temperature differences between said first and second locations exceeding said small predetermined temperature difference and being turned off in response to voltage outputs resulting from temperature differences between said first and second locations not exceeding said small predetermined temperature difference, a solenoid in series with said transistor connections to said source adapted to close said switch to turn on said ventilator means when said transistor is turned on and to open said switch to turn off said ventilator means when said transistor is turned off.

4,136,823

APPARATUS FOR THE PREVENTION OR LIMITATION OF WATER DAMAGE

Bengt G. A. E. Kullberg, Storövägen 20, S-141 42 Huddinge, Sweden

Filed Feb. 17, 1977, Ser. No. 769,667
Claims priority, application Sweden, Feb. 26, 1976, 7602561
Int. Cl.[2] H01H *35/00*; F24D *3/00*
U.S. Cl. 237—8 R **9 Claims**



1. An apparatus for limiting water damage in structural floors and covering floors in a building which have water-carrying means connected to a central water circulating apparatus, characterized by at least one moisture sensing device positioned at floor level in proximity with said water-carrying means, a relay means connecting said relay to the moisture sensing means, a direct acting thermostatic valve positioned in the central water circulating apparatus supplying the water-carrying means to control the flow of water to the water-carrying means, said valve having a sensing body for actuating the valve, a heating element arranged in proximity with the sensing body, and circuit means connecting said heating element through a source of electric current to said relay to be controlled thereby, said relay being arranged to close the circuit means energizing the heating element from an impulse from the sensing device indicating that a predetermined moisture limit has been exceeded and operative to actuate the thermostatic valve to close the flow of water to the water-carrying means.

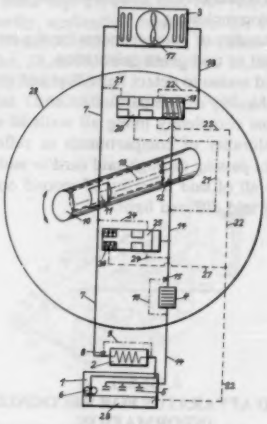
4,136,824

DEVICE USING OIL FOR HEATING THE OPERATOR'S CAB OF A MACHINE

Heinz-Dieter Kallenbach, Cologne, Fed. Rep. of Germany, assignor to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 26, 1977, Ser. No. 800,704
Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623621
Int. Cl.[2] B60H *1/14*; F01P *11/08*; F16N *39/02*
U.S. Cl. 237—12.3 R **11 Claims**

1. A system for supplying heat to the operator's compartment of an internal combustion engine driven vehicle comprising in combination: a heat exchanger for supplying heat to the operator's compartment, a lubricating system for the engine including a pump having the suction side connected to the engine oil sump, a supply conduit leading from the discharge side of the pump to said heat exchanger and a return conduit leading from said heat exchanger to the oil sump, a control valve common to said conduits being a manually adjustable rotary valve member to open and close conduits respectively for heat feeding and heat return with one position in which said conduits are connected to said heater exchanger and a second position in which the conduits are connected together and bypass the heat exchanger, a normally closed bypass valve interposed between said conduits on each side of said control valve and each movable into open position in response to a predetermined pressure in a respective one of said conduits, said valves being combined with a unitary valve block having support means for an oil filter and flange means for connection of the block to the engine, said block also including means for



receiving said supply and return conduits, said system after a cold start avoiding withdrawal of any heat during a heating phase though simultaneously for heating in a fool proof manner gradually exchanging cold lubricating oil independent of servicing errors, said system capable of being added later to an internal combustion engine.

4,136,825

ORIFICE SEALING DEVICE

Frank J. Mack, Kinnelon, and Michael P. Demkowicz, New Providence, both of N.J., assignors to American Home Products Corporation, New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,967
Int. Cl.[2] A61L *9/01*
U.S. Cl. 239—44 **3 Claims**

1. A space air treating device comprising in combination:
A. a container having a restricted neck;
B. a liquid air treating composition container in said container;
C. an elongated wick assembly disposed within said container in contact with said liquid composition and further comprising;
1. an outer member comprised of non-woven cotton;
2. an inner core comprised of cellulosic material, which when wetted by said liquid composition, absorbs from 14–20 times its weight of said liquid composition and expands from 100 to 175 percent of its original cross-

sectional area, and which when wetted, expands against said restricted neck with a pressure of 2 to 3.4 pounds per thousand square feet,

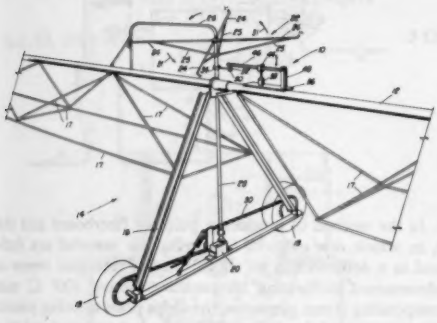
whereby said wick assembly fills the interior of said restricted wick and prevents said liquid composition from spilling from said container, while permitting said liquid composition to move by wicking action along said wick assembly into contact with the air to be treated.

4,136,826

WATER ACTIVATED STOP FOR SPINNERS

Harry S. Ausherman, 715 Fairway, Wichita, Kans. 67212

Filed Nov. 18, 1977, Ser. No. 852,611
Int. Cl.² A01G *25/16*
U.S. Cl. 239—212 **6 Claims**



1. A water activated stop device for spinners mounted on the main water distribution pipe of a center pivot irrigation system, the device comprising:

a water cylinder mounted on top of the main water distribution pipe and communicably connected to the water supply in the water distribution pipe;

a piston mounted in said cylinder, said piston extending upwardly and outwardly from the top of said cylinder, said piston raised upwardly in said cylinder when the water pressure is applied thereto, said piston lowered downwardly when the water pressure is turned off; and

stop means pivotally mounted on top of the water distribution pipe and raised and lowered by said piston, said stop means for releasably engaging the spinner when the water pressure is turned off.

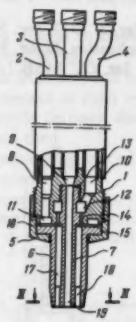
4,136,827

OXYGEN-FUEL CUTTING TORCH

Nikolai Y. Mushenko, ulitsa N. Kurchenko, 15, kv. 48; Gennady P. Larin, ulitsa Sotsialisticheskaya, 57, kv. 5; Vladimir P. Seredenko, ulitsa S. Lazo, 45, kv. 10, and Ivan P. Svetikov, ulitsa Marata, 11, kv. 16, all of Kramatorsk, U.S.S.R.

Filed Feb. 28, 1977, Ser. No. 772,445
Int. Cl.² F23D *11/16*
U.S. Cl. 239—419.3 **1 Claim**

1. An oxygen-fuel cutting torch comprising: a head having three ducts longitudinally extending therethrough, a first of said ducts communicating with a first annular chamber made in said head, a second of said ducts communicating with a second annular chamber, and a third of said ducts being wider at its outlet portion; three gas supply conduits, each being connected to said head and communicating with a respective longitudinal duct; an inner tip secured in the outlet portion of the third duct in said head and defining together with the surface of said duct said first annular chamber and a longitudinal annular metering passageway communicating therewith; an outer tip disposed coaxially with said inner tip, the face of said outer tip and the face of said head defining a transverse annular metering passageway communicating with said second annular chamber, said outer and inner tips defining a mixing channel communicating with said longitudinal and transverse annual metering



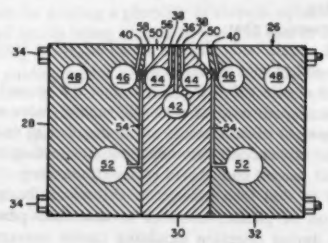
passageways for obtaining a fuel gas mixture and for letting it out; and a nut coupling said outer tip and said head together.

4,136,828

OXIDE DEPOSITING RIBBON BURNER

Joseph W. Anderson, Corning; Donald L. Guile, and Roy E. Smith, both of Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jun. 27, 1977, Ser. No. 810,308
Int. Cl.² F23D *11/16*
U.S. Cl. 239—422 **5 Claims**



1. A burner for producing a flame in which a reactant gas undergoes a chemical reaction comprising

a housing, a portion of which defines a burner face,

means in said housing defining a first linear array of orifices for providing a plurality of streams of said reactant gas,

means in said housing defining second and third parallel linear arrays of orifices, for directing angled streams of combustible gas which intersect the streams of reactant gas, said second and third arrays being disposed on opposite sides of said first array and being equally spaced therefrom, and

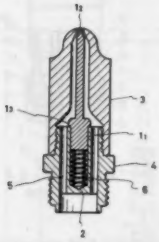
means disposed between said first array of orifices and said second and third arrays of orifices, respectively, for providing a first shield gas at a velocity less than that with which said reactant gas issues from said first orifices, the total flow rate of said first shield gas being greater than that of said reactant gas, said means for providing a first shield gas comprising first and second elongated rectangular slots in said burner face, one of said slots being disposed between said first linear array and each of said second and third linear arrays, the width of each of said slots being at least one half the distance between said first and second arrays.

4,136,829

NEEDLE NOZZLE HAVING A VALVE

Mitsuhiro Kanao, 2156-14 Yakeyama-Cho, Kure-shi, Hiroshima-ken, Japan

Filed Mar. 3, 1977, Ser. No. 774,168
Claims priority, application Japan, Mar. 4, 1976, 51-23892
Int. Cl.[2] B05B *1/30*
U.S. Cl. 239—533.1 3 Claims



1. In an injection nozzle, for injection moulding of synthetic resinous plastics, having:

(a) a nozzle body including a feed passage leading to an outlet opening, said nozzle body defining at said opening a first valve seating, said nozzle body including a cylinder chamber having first and second ends,

(b) a needle valve member movable in said feed passage and including a first valve element shaped to coact with said first valve seating, said needle valve member including a piston slidable in said cylinder chamber,

(c) spring loading means positioned in said cylinder chamber and abutting the piston to urge the needle valve member in the direction to close said first valve element and valve seating,

the improvement that:

(i) said nozzle body defines a second valve seating at said first end of said cylinder, and

(ii) said needle valve member includes a second valve element shaped to coact with said second valve seating, and movement of said needle valve member in said direction opens said second valve element and seating, and

(iii) said second end of said cylinder chamber

is closed to said feed passage of the nozzle body, whereby application of plastics material to said feed passage under pressure during injection moulding causes movement of the needle valve member in the reverse direction to open said first valve element and valve seating, and to close said second valve onto said second valve seating, thereby to seal said cylinder chamber against entry of plastics material.

4,136,830

ORE GRINDING PROCESS CONTAINING COPOLYMER GRINDING AIDS

Willy Manfroy, Carmel, Ind., and Richard R. Klimpel, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 687,796, May 19, 1976, abandoned. This application Nov. 21, 1977, Ser. No. 853,731
Int. Cl.[2] B02C *23/18*
U.S. Cl. 241—16 17 Claims

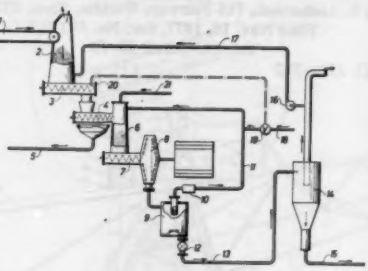
1. A process for grinding coal or ores containing metal values comprising carrying out said grinding in the presence of a liquid medium and a polyelectrolyte grinding aid comprising copolymers of styrene with maleic anhydride, itaconic acid or citraconic acid, said grinding aid being dispersible in said medium, and being employed in an amount effective to provide increased grinding efficiency.

4,136,831

METHOD AND APPARATUS FOR MINIMIZING STEAM CONSUMPTION IN THE PRODUCTION OF PULP FOR FIBERBOARD AND THE LIKE

Karl Cederquist, Stockholm, Sweden; Bernard Marechal, Biarritz, France, and Stig Selander, Stockholm, Sweden, assignors to Isel S.A., Paris-la-Defense, France

Filed Aug. 4, 1977, Ser. No. 821,711
Claims priority, application Sweden, Aug. 6, 1976, 7608847
Int. Cl.[2] B02C *23/40*
U.S. Cl. 241—18 8 Claims



1. In the method of producing pulp for fiberboard and the like, in which raw chips of lignocellulosic material are defibrated in a defibrator in an atmosphere of saturated steam at predetermined defibrating temperatures above 100° C. and corresponding steam pressures, the chips prior to being passed to the inlet side of the defibrator having been presteamed to a predetermined temperature by atmospheric steam released from the mixture of steam and pulp at the outlet side of the defibrator, compressed and dewatered to a dryness of at least 50%, the improvement for minimizing steam consumption, comprising:

(a) separating a portion of the high-pressure high-temperature steam from the mixture of steam and pulp discharged at the outlet end of the defibrator;

(b) increasing the pressure of said separated portion to impart thereto sufficient heat content to heat the presteamed chips at the inlet side of the defibrator to the predetermined defibrating temperature; and

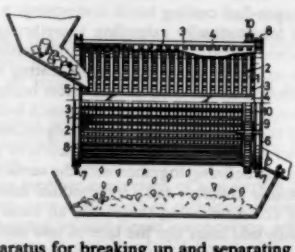
(c) recirculating said pressurized separated portion to the inlet side of the defibrator.

4,136,832

METHOD AND APPARATUS FOR BREAKING UP AND SEPARATING WASTE GLASS TO OBTAIN CULLET

Kaneji Morita; Akio Sugie, both of Nishinomiya, and Kunio Ishioka, Kobe, all of Japan, assignors to Yamamura Glass Kabushiki Kaisha and Junzo Shimoiizaka, both of, Japan

Division of Ser. No. 741,490, Nov. 12, 1976, Pat. No. 4,069,979. This application May 12, 1977, Ser. No. 796,464
Int. Cl.[2] B02C *17/02*
U.S. Cl. 241—91 5 Claims



1. An apparatus for breaking up and separating waste glass to obtain cullet comprising a grizzly made up of parallel bars

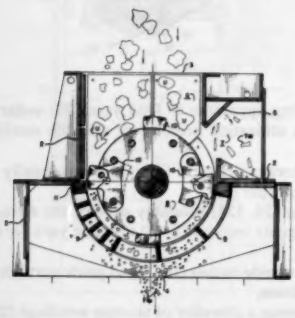
arranged at a spacing smaller than the minimum width of projection of three-dimensional extraneous matter and auxiliary parallel bars disposed over one surface of the grizzly and arranged at right angles to the bars to form a lattice, the openings of the lattice having a diagonal dimension smaller than the maximum width of projection of planar extraneous matter, the lattice being in the form of a rotatably drum with the grizzly defining the inner periphery thereof and having scraper plates attached to the inner periphery, and an inlet for the waste glass and an outlet for the extraneous matter provided at the opposite ends of the lattice drum respectively.

4,136,833

RENEWABLE TIP HAMMER FOR A CRUSHER

Lloyd K. Knight, Columbus, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 9, 1977, Ser. No. 794,874
Int. Cl.[2] B02C *13/04*
U.S. Cl. 241—194 **3 Claims**



1. In a swing-hammer type crusher having a rotor with a plurality of radial discs spaced along its shaft and a plurality of hammers pivotably mounted at selected locations about the rotor, the improvement wherein:

each hammer consists of a shank pivotably mounted at one end between a pair of rotors discs and has a free end movable between said rotor discs, and a replaceable tip section connected to the free end of the shank by a straight connecting pin extending freely through co-aligned holes in the tip section and shank, and the rotor includes a removable pivot stop positioned adjacent each hammer between said pair of discs to limit the outward pivotal freedom of the hammer shank so that the connecting pin is confined between said pair of rotor discs at all times during operation of the crusher but which can be removed to allow the shank to pivot outward until the connecting pin is outside the rotor discs and can be extracted to replace the tip section when desired.

4,136,834

METHOD AND DEVICE FOR INSERTING THREADS, YARNS AND THE LIKE INTO A WINDING DEVICE

Alfred Tschentscher, Cologne, Fed. Rep. of Germany, assignor to FMN Schuster & Company, Hurth Efferen, Fed. Rep. of Germany

Filed Jun. 20, 1977, Ser. No. 808,089
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1976, 2627643
Int. Cl.[2] B65H *54/02, 54/20*
U.S. Cl. 242—18 PW **24 Claims**

1. A method of inserting threads, yarns, and the like, into a winding device having an open-ended slot and a plurality of traversing devices disposed along said slot, each traversing device including a reverse thread roller mounted in a casing, said winding device including means for supporting a spool adjacent each traversing device, each spool having a catch slot, said method comprising the steps of:

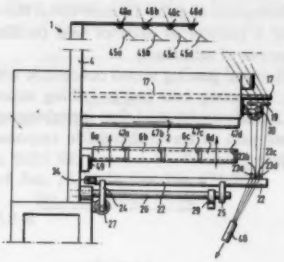
a. guiding a plurality of threads equal to the number of spools being wound to one end and in the front of the winding device,

b. said threads being guided in common as a bundle, yet separately from one another,

c. moving the threads from said one end into a spaced apart relationship with respect to each other corresponding to the line of said spools through the insertion slot of the winding device, and then

d. simultaneously inserting the spaced apart threads into the catch slots of the spools.

3. An assembly for inserting threads, yarns, and the like, into a winding device having an open-ended insertion slot and a plurality of traversing devices disposed along said slot, each



traversing device including a reverse thread roller mounted in a casing, said winding device including means for supporting a spool adjacent each traversing device, each spool having a catch slot, said assembly comprising:

a. means for guiding a plurality of threads equal to the number of spools being wound to one end and in front of the winding device,

b. said guiding means being effective to guide the threads in common as a bundle, yet separately from one another,

c. means for moving the threads from said one end into a spaced apart relationship to each other corresponding to the line of said spools through the insertion slot of the winding slot, and

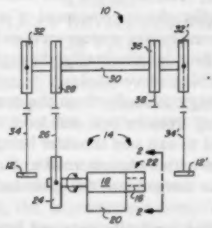
d. means for simultaneously inserting the spaced apart threads into the catch slots of the spools.

4,136,835

BUILDER MECHANISM FOR TEXTILE MACHINE

Frank E. Brooks, Seneca, and Guenther C. Wunderlich, Easley, both of S.C., assignors to Platt Saco Lowell Limited, Rossendale, England

Filed Mar. 16, 1978, Ser. No. 887,269
Int. Cl.[2] B65H *54/36*
U.S. Cl. 242—26.4 **10 Claims**



1. In a builder mechanism for vertically moving the ring rails

of a textile spinning machine during package building operation thereof through progressively advancing reciprocatory strokes; said builder mechanism including a shaft movable substantially synchronously with said ring rails in opposite rotative directions through progressively advancing oscillatory strokes; first switching means adapted to be periodically advanced along an arcuate path of travel substantially concentric with and spaced radially from the axis of said shaft; and second switching means connected to said shaft for movement therewith into and out of cooperating relationship with said first switching means along an arcuate path of travel adjacent that of said first switching means; the improvement comprising:

a pick gear mounted in concentric relationship to said shaft for rotative movement about the axis thereof;

pawl means connected to and movable in unison with said shaft adjacent said pick gear for rotating said pick gear a predetermined angular distance about the axis of said shaft during a portion of each of said oscillatory strokes of movement of said shaft;

and differential gearing means concentric with said shaft and innerconnecting said first switching means and said pick gear for advancing said first switching means along said arcuate path of travel thereof in response to rotation of said pick gear.

4,136,836

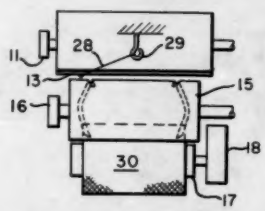
YARN WINDING METHOD AND DEVICE THEREFOR

Richard L. Akers, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 16, 1977, Ser. No. 861,306

Int. Cl.[2] B65H *54/28*

U.S. Cl. 242—43 R **12 Claims**



1. In a yarn winding apparatus for winding generally cylindrical cross-wound yarn packages in reciprocating strokes, said apparatus including a first traverse device having a reciprocable yarn guide for guiding the yarn over the mid range of the strokes and a second traverse device embodying a rotatably driven cylindrical roller having groove means for guiding the yarn at the respective ends of the strokes to impart stroke reversal to the yarn guided therein, said groove means having successive helical, reversal curve, and helical portions in the surface of said roller, the improvement of which comprises:

said groove means having a cross-sectional profile taken in a plane extending longitudinally through the axis of the roller comprising successively:

a shoulder facing outwardly from the center of the strokes and extending from its one end from the surface of the roller toward its axis said shoulder being at an angle of up to 15 degrees with a plane normal to the axis of the roller;

a valley portion merged into the other end of said shoulder; and

a ramp extending gradually outward from said valley and away from the axis of the roller, said ramp intersecting the surface of the roller at an angle of about 15 degrees.

4,136,837

POSITIVE TAPE FEED WITH MULTIPLE YARN WINDINGS

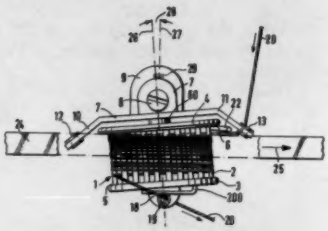
Josef Fecker, Bisingen-Steinhofen, and Gustav Memminger, Freudenstadt, both of Fed. Rep. of Germany, assignors to Gustav Memminger Verfahrenstechnik für die Maschenindustrie, Freudenstadt, Fed. Rep. of Germany

Filed Aug. 26, 1977, Ser. No. 827,869

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1976, 2639207

Int. Cl.[2] B65H *51/02*; D04B *15/48, 35/14*

U.S. Cl. 242—47.01 **13 Claims**



1. Yarn feeding apparatus to feed yarn (20) under slip-free conditions to a utilization position of a textile machine comprising

a rotatable storage drum (1) forming an essentially cylindrical storage drum (1);

a drive means (24, 124) rotatably driving the storage drum;

supply yarn guide means (12, 13) to guide yarn for supply to said drum;

removal yarn guide means (18, 19) to guide yarn for removal from the drum,

the yarn forming a plurality of storage windings (23) on the drum before removal therefrom at a rate corresponding to the rotational speed of the drum,

wherein the drive means (24, 124) are positioned relative to the drum (1) to engage the drum at the outer circumference thereof, in the region of a portion of the axial length of the drum, at least a portion of the plurality of windings of the yarn on the storage drum being located in the zone of engagement between the drive means (24, 124) and said drum (1) to provide for direct frictional engagement of at least a portion of the yarn on the drum and said drive means, and wherein the axis of rotation (26) of the drum (21) forms an acute angle (28) with a line (27) perpendicular to the direction of movement of said drive means (24, 124) to apply an axially directed force to the yarn on the drum beneath the drive means to feed all the storage windings of the yarn on the drum axially along the storage drum.

4,136,838

MACHINE FOR WINDING MAGNETIC TAPES ONTO CASSETTES

Angelo Bosco, Milan, Italy, assignor to AEG-Telefunken-Societa Italiana per Azioni, Milan, Italy

Filed Feb. 18, 1977, Ser. No. 770,051

Claims priority, application Italy, Mar. 1, 1976, 20733 A/76

Int. Cl.[2] B65H *19/20*

U.S. Cl. 242—56 R **5 Claims**

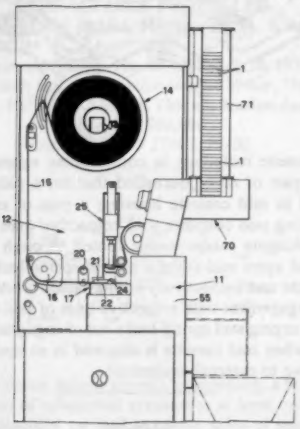
1. A machine for winding magnetic tapes within cassettes provided with a neutral connecting tape joining together a pair of spools situated inside the cassette, comprising:

two parallel operating assemblies disposed one in front of the other, one of which is used for the preparation of the cassette by partially extracting the connecting tape from said cassette, and the other issued for filling the cassette with magnetic tape by cutting the already extracted connecting tape into two parts connected to respective spools

in the cassette and joining said parts to respective ends of a desired length of magnetic tape;

said filling assembly comprising support and unwinding means for a reel of magnetic tape, a support and filling seat for the cassette and cutting and jointing means disposed in the path of the magnetic tape between the reel and the cassette;

said preparation assembly comprising a temporary support seat for the empty cassette disposed in front of said support and filling seat of the filling assembly, and extractor means for extracting a middle portion of connecting tape from the empty cassette and disposing said portion in front of said cutting and jointing means of the filling assmebly;



means for causing the mutual approach of said parallel operating assemblies;

first transfer means operable with the operating assemblies in the approached position to transfer the cassette from said temporary support seat of the preparation assembly to said support and filling seat of the filling assembly; and

second transfer means operable with the operating assemblies in the approached position to simultaneously transfer the already extracted connecting tape from the preparation assembly to said cutting and jointing means of the filling assembly.

4,136,839

CASSETTE FOR TAPE, PARTICULARLY LIGHT-SENSITIVE TAPE

Karl Walter, Penzberg, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

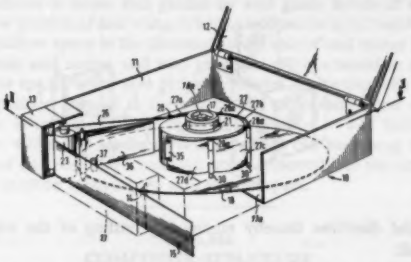
Filed Aug. 29, 1977, Ser. No. 828,962

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638697

Int. Cl.² G03B *1/04*

U.S. Cl. 242—71.1 **13 Claims**

1. A cassette for tape, particularly light-sensitive tape, comprising a housing having an inlet; a turntable in said housing and provided with a tape-engaging hub, said turntable being rotatable about a normally upright axis in one direction to take a tape up on said hub and in another direction to pay the tape out from said hub; first means for guiding a tape between said inlet and said hub; and second means partially circumferentially surrounding said hub and including an articulated band composed of a plurality of arcuately curved sections successive ones of which are hinged to one another and operable to contract about the hub in response to rotation of said turntable in said one direction so as to urge the incoming tape against the hub, and to expand about the hub in response to rotation of said



turntable in the other of said directions so as to permit unobstructed paying-out of the outgoing tape from the hub.

4,136,840

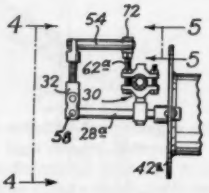
CORD TAKE-UP REEL FOR AN ELECTRIC LAWN MOWER

Charles A. Bates, 5555 SE. Salmon, Portland, Oreg. 97215

Filed Jan. 23, 1978, Ser. No. 871,707

Int. Cl.² B65H *17/46*

U.S. Cl. 242—86.5 R **7 Claims**



1. A cord take-up reel for use on an electric lawn mower having a pair of laterally opposed handles comprising:

a spool assembly having a pair of fixed shafts extending outwardly from opposite sides thereof along the rotational axis of said spool assembly, said spool assembly being adapted to take up and pay out an electric cord when said assembly is rotated in one direction or the other,

mounting means on each of the laterally opposed handles for detachably and rotatably mounting an associated one of said shafts, and

a crank pivotally attached to one of said shafts for selective positioning between a winding position wherein said crank may be freely moved to rotate said spool assembly, and a stowed position.

4,136,841

AUTOMATIC ROLL-UP DEVICE FOR SAFETY BELTS IN MOTOR VEHICLES

Artur Föhl, Schorndorf, Germany, assignor to Repa Feinstanzwerk GmbH, Alfdorf, Germany

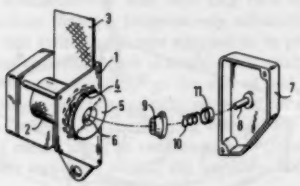
Filed Sep. 8, 1977, Ser. No. 831,532

Int. Cl.² A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107 **10 Claims**

1. In an automatic roll-up device for safety belts in motor vehicles having a winding shaft supported, with bearing play, in a bearing block, the improvement comprising at least one support roll mounted for rotation on an axle and driven by the winding shaft, a housing to which said axle is attached enclosing the support roll, spring means urging the support roll away

from the housing into engagement with a running surface of the winding shaft to exert pressure on the winding shaft in the



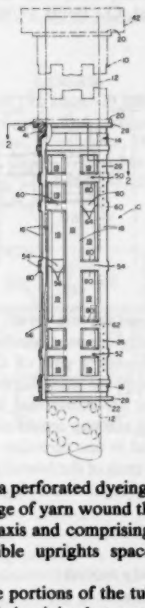
radial direction thereby minimizing rattling of the winding shaft.

4,136,842

FLEXIBLE DYE TUBE

Stanley Livingstone, Charlotte, and Gordon H. Broome, Mount Holly, both of N.C., assignors to American & Efird Thread Mills, Inc., Mount Holly, N.C.

Filed Jul. 27, 1977, Ser. No. 819,400
Int. Cl.[2] B65H *75/20*
U.S. Cl. 242—118.11 **14 Claims**



1. A tube for use on a perforated dyeing spindle, for supporting for dyeing a package of yarn wound therearound, said tube having a longitudinal axis and comprising:

a plurality of flexible uprights spaced circumferentially around said axis,

top and bottom base portions of the tube,

each said upright being joined at opposite ends to said base portions, respectively, and

a plurality of rings joining said uprights in spaced planes perpendicular to said axis,

at least two of said rings being incomplete by having, respectively, gaps at circumferentially staggered positions so as to leave one pair of adjacent uprights free to approach each other in one of said planes and a second pair of adjacent uprights free to approach each other in a second of said planes, each portion of each ring adjacent to a gap extending circumferentially to join more than two adjacent uprights, thereby providing said tube with balanced and limited radial flexibility to accommodate yarn shrinkage,

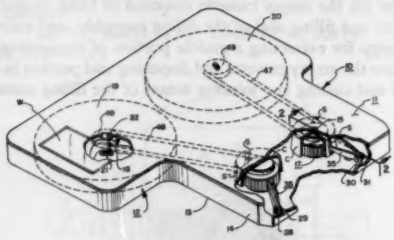
said spaced uprights, base portions, and rings cooperatively defining a plurality of dye openings through said tube.

4,136,843

TAPE CASSETTE HAVING REEL LOCKING MEANS THEREIN

Dennis R. Gourley, Salt Lake City, Utah, assignor to Film Cassette Inc., Salt Lake City, Utah

Filed Mar. 17, 1977, Ser. No. 778,487
Int. Cl.[2] G11B *23/10*
U.S. Cl. 242—198 **6 Claims**



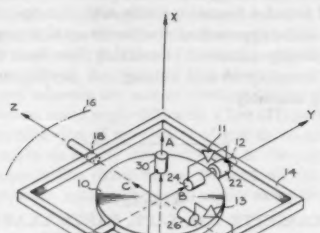
1. A cassette including, in combination: a cassette housing having a pair of reels journalled therein; a pair of couplers journalled in said cassette housing; a pair of endless means intercoupling said couplers with respective ones of said reels; flexible, elongate media means routed through said cassette and wound upon said reels; a pair of spring-locks carried by said cassette and respectively spring-biased toward releasable locking engagement with respective ones of said couplers; and means for urging said spring-locks out of engagement with said couplers when said cassette is disposed in an operative condition relative to external equipment.

4,136,844

QUASI-INERTIAL ATTITUDE REFERENCE PLATFORM

Inge Maudal, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Mar. 15, 1976, Ser. No. 667,240
Int. Cl.[2] F41G *9/00*; F42B *15/02, 15/00*
U.S. Cl. 244—3.2 **10 Claims**



1. A space-stable reference platform system comprising:

a frame rotatable about at least one axis;

a platform having three orthogonal axes;

sensing means for sensing rotational movement of the platform about all of said orthogonal axes, said sensing means being positioned on said platform;

inner and outer gimbals for mounting the platform for movement relative to the frame such that the platform is capa-

ble of two-degrees-of-freedom axial rotation about first and second orthogonal axes, the outer gimbal being pivotably mounted on the frame, the inner gimbal including the platform being pivotably mounted to the outer gimbal;

first means responsive to said sensing means for rotating said gimbals relative to the frame in order to maintain the platform aligned in space with respect to said first and second axes; and

second means responsive to said sensing means for rotating said frame in order to maintain the platform aligned in space with respect to the third orthogonal axis.

4,136,845

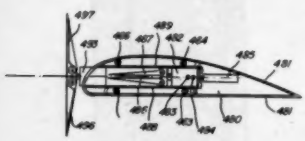
HYDRAULICALLY OPERATED AIRCRAFT WITH A RETRACTABLE PROPELLER

Karl Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan (240-01)

Continuation-in-part of Ser. No. 487,272, Jul. 10, 1974, Pat. No. 4,009,849, which is a continuation-in-part of Ser. No. 104,676, Mar. 8, 1971, Pat. No. 3,823,898. This application Jan. 17, 1977, Ser. No. 760,006

Int. Cl.[2] B64D *27/00, 29/00*

U.S. Cl. 244—54 **1 Claim**



1. A fluid-stream driven aircraft, comprising, a body having a medial plane of substantial symmetry; at least one wing extending substantially on both opposite sides of said plane; at least one pair of hydraulic fluid operated motors on portions of said aircraft; at least one pair of fluid stream creating means driven by said motors, respectively, and arranged symmetrically on opposite sides of said medial plane; at least one hydraulic fluid flow producing means having at least one pair of separate fluid-handling chamber groups of equal volumes, at least one pair of separate outlets with each one of said chamber groups connected to one outlet of said outlets, respectively, and including means for fluid-tight separation of the chambers and outlets so that fluid from each chamber group passes through one of said outlets only; at least one pair of displacement means associated with said fluid-handling chambers, respectively; equally acting actuator means actuating and defining the displacement volumes of said chambers, respectively, and cooperating at equal times and in unison with said displacement means for maintaining equal movements of said displacement means so that fluid flows in said outlets at proportionate and equal flow rates; a pair of delivery passage means connecting each of said outlets with a different one of said motors, respectively; said actuator means set to provide equal strokes of said displacement means; said motors containing fluid intaking chambers of equal number and equal volumes for equal number of revolutions at equal quantities of intake of flow of fluid; said motors having each at least one pair of ports; said ports of said motors of each pair of motors on opposite sides of said medial plane communicated vice-versa to said delivery passage means for revolving said motors of the respective pair of motors in opposite directions at equal rate of revolutions, whereby said stream-creating means on opposite sides of said medial plane are torque-balanced and driven at equal velocities for producing equal thrusts on both sides of said medial plane to stabilize the movement and attitude of said aircraft; wherein said wing includes at least one hollow space; wherein said fluid stream creation means includes at least one propeller; wherein said propeller includes at least two blades which are swingably borne in a holding portion; wherein said blades of said propellers can be swung from a position normal to the axis of the said propeller to a position substantially parallel to the axis of said propeller; wherein said hollow space is associated to guide means; wherein said motor is provided with at least one guide portion; wherein said guide portion of said motor is borne and guided by said guide means of said hollow portion of said wing; wherein said motor is moveable in said hollow space in the direction of the axis of said motor and wherein said motor and said propeller are contained in said hollow space, when said propeller blades are swung into the said position parallel to the axis of said motor and when said motor is retracted to the innermost position in said hollow space, while said blades of said propeller can be swung into both of said positions when said motor is moved into the outermost position relatively to said hollow space.

4,136,846

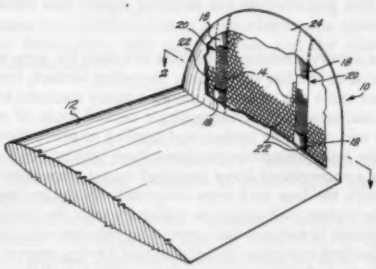
COMPOSITE STRUCTURE

Paul C. Brault, Bellevue, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Dec. 20, 1976, Ser. No. 752,691

Int. Cl.[2] B32B *3/12*

U.S. Cl. 244—123 **7 Claims**



1. A composite structure comprising: a primary load carrying member of a high density honeycomb strip covered on each face with unidirectional fiber tape to extend lengthwise along the strip, a low density honeycomb core along each side of the primary load carrying member, and a reinforced plastic to cover the core and primary load carrying member to form an integrated structural member.

4,136,847

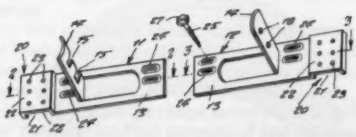
WINDOW SHADE AND CURTAIN ROD BRACKET PLATE

Carl F. Murray, 3140 Mohican Ave., Dayton, Ohio 45429

Filed Apr. 12, 1978, Ser. No. 895,544

Int. Cl.[2] A47H *1/142*

U.S. Cl. 248—256 **1 Claim**



1. A window shade and curtain rod bracket plate assembly, comprising, in combination, a pair of right and left hand bracket units, each of which comprises a metal plate having a tongue struck out from a center thereof, and bent at right angles thereto, each of said tongues having support means for supporting a window shade either closer or further from a window, and means at one end of said metal plate for selectively supporting either a double curtain rod bracket, a single curtain rod bracket, a large cafe rod bracket or a traverse rod bracket; and said tongue supports a secondary bracket which carries said support means for said window shade, said tongue

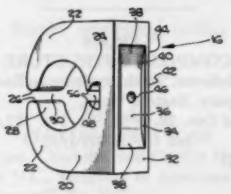
having a longitudinally extending slot therein, said secondary bracket is "U"-shaped with one leg thereof having a transverse, offset bend thereacross for sliding in said slot, and rigid securement means of said secondary bracket to ssid tongue in a selected slided position.

4,136,848

BRACKET

Robert H. McCollum, 2833 Merlin Ave., Fullerton, Calif. 92635

Filed Feb. 7, 1977, Ser. No. 766,128
Int. Cl.² A47F 5/00
U.S. Cl. 248—316 R **12 Claims**



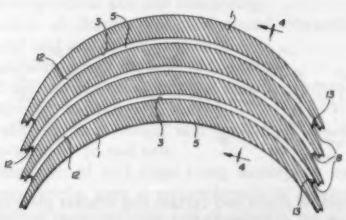
1. In a unitary elastomeric bracket structure for supporting a fishing rod or the like on a planar mounting surface, comprising a base and a pair of arms defining a partly enclosed bracket cavity, said structure having a single central locus of securement to said mounting surface and tending to pivot about said locus, the improvement comprising base bottom wall means defining a securement locus centered recess peripherally coplanar with the base said arms cooperatively interacting with said base bottom wall means to resiliently vary the dimensions of said recess in vacuum seal generating relation responsive to arm deflecting reception of a rod in said cavity, whereby said wall means is flexibly responsive in surface sealing relation against pivoting of said structure about its securement locus.

4,136,849

APPARATUS FOR MANUFACTURING CONCRETE BUILDING SECTIONS

James C. Abercrombie, 177 Alison Rd., Thamesford, Ontario; James D. Pinchin, 199 Commissioners Rd., E. London, Ontario, both of Canada, and Jack J. Van Loon, Thamesford, Canada, assignors to James Carman Abercrombie, Thamesford and James Davis Pinchin, E. London, both of, Canada

Continuation-in-part of Ser. No. 623,030, Oct. 16, 1975, abandoned. This application Jul. 22, 1977, Ser. No. 818,342
Claims priority, application Canada, Sep. 11, 1975, 235282
Int. Cl.² E04G 11/06
U.S. Cl. 249—18 **5 Claims**



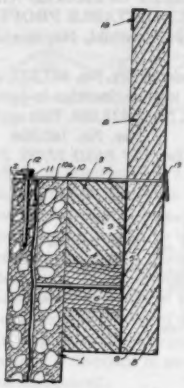
1. Apparatus for molding a plurality of large curved concrete bodies of the same constant thickness comprising, at least three vertically oriented rigid forms each having first and second faces, said forms being releasably connected in alignment whereby said first face of one form is situated adjacent to and horizontally spaced from said second face of an adjacent form, said first face having a transverse concave curvature with a first radius, said second face having a transverse convex curvature with a second radius which is equal to said first radius minus said thickness of said body such that the first face of one form is spaced from the second face of an adjacent form by a distance equal to the thickness of the body, said first radius of each form being equal to the first radius of the other forms and said second radius of each form being equal to the second radius of the other forms.

4,136,850

FORM FOR POOL DECKS

Gregory E. Grosch, 1153 Del Sol La., Diamond Bar, Calif. 91766

Filed May 18, 1977, Ser. No. 797,991
Int. Cl.² E04G 11/04
U.S. Cl. 249—19 **10 Claims**



1. A form attachable to the upper periphery of a pool wall, for casting a cantilevered margin of a concrete slab pool deck, said form comprising:

a. a set of first form units being molded of deformable foamed plastic material having a surface adapted to conform to the upper periphery of the pool wall and having an upper surface adapted to be positioned essentially flush with the upper terminum of the pool wall;

b. sets of concrete penetrating elements adapted to extend through the form units and into the concrete forming the upper periphery of the pool wall to secure the first form units in conformity therewith;

c. means distributing the force of the penetrating elements with respect to the first form units;

d. a set of second form units, molded of deformable foamed plastic material to present a surface conformable to the outer extended surface of the first form units, and projecting above the first form units a distance approximating the intended thickness of the cantilevered margin of the deck slab to be formed above the first form units;

e. and adhesive means removably joining the outer extended surface of the set of first form units and confronting surface of the set of second form units.

4,136,851

VALVE FOR FIRE EXTINGUISHING SYSTEM OF GAS DISTRIBUTION TYPE

Arne Hansen, New City, N.Y., and George Troup, Hatboro, Pa., assignors to Chemetron Corporation

Filed Aug. 25, 1976, Ser. No. 717,754
Int. Cl.² F16K 31/122
U.S. Cl. 251—63 **2 Claims**

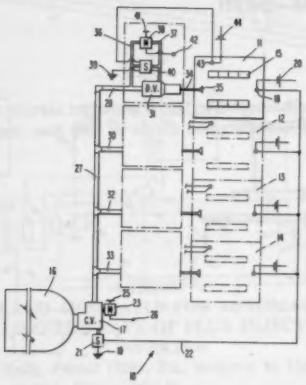
1. In a valve for pressurized fluid, of a type comprising:

(a) a casing having an inlet for the pressurized fluid at one end thereof and having an outlet including a valve seat at the other end;

(b) a piston positioned within said casing having a wall defining an internal cavity in continuous communication

with said casing inlet and having a closed end, said piston being slidable within said casing between a first position wherein said closed end engages said valve seat and a second position wherein said closed end is displaced from said valve seat;

(i) said piston having at least one opening through said wall adjacent said closed end thereof, said opening providing a communication path between said internal cavity and said outlet when said closed end is displaced from said valve seat, whereof said piston has a first pressure-operative surface portion exposed to fluid pressure from said internal cavity so as to urge said piston toward said second



position and a second pressure-opertive surface portion normally not in direct communication with said internal cavity; and

(c) separate, selectively-open, pressurized fluid path means for connecting said inlet to said second pressure-operative surface portion for selectively urging said piston toward its second position for displacing said closed end from said valve seat;

the improvement including means for venting said second pressure-operative surface to said internal cavity only when said piston is in said second position whereby said piston remains in said second position.

4,136,852

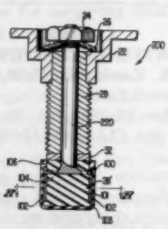
EXPANSIBLE PLUG VALVE

Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Rutland, Mass.

Continuation-in-part of Ser. No. 604,550, Aug. 14, 1975, Pat. No. 3,990,677, which is a division of Ser. No. 392,967, Aug. 30, 1973, Pat. No. 3,907,251. This application Oct. 6, 1976, Ser. No. 730,262

Int. Cl.[2] F16K *25/00*

U.S. Cl. 251—189 **3 Claims**



1. A flow valve for use in a valve housing having a flow passage, a valve chamber extending transversely to and intersecting said flow passage,

a valve plug assembly movable in said chamber to open and close said flow passage, and

a handle connected to said valve assembly for moving said valve assembly comprising

a valve stem extending through said chamber, one end of the valve stem being located within the chamber and the other end being connected to said handle,

a valve plug secured to the said one end of said valve stem, said plug being slidably movable in said chamber to open and close said flow passage, and formed of a resiliently expansible and compressible material, said plug having a sealing portion located in said channel between said fluid passage and said valve chamber, and

means for expanding said sealing portion outwardly against said channel into fluid-tight sealing relationship with said channel, said valve plug including an inner body portion of elastomeric material and said stem including a flange portion at the lower end thereof, embedded in said body portion but extending peripherly beyond said body portion, a peripheral flange portion formed on said inner body portion and spaced from flanged portion of said stem, a ring member of nonexpansible material interposed between said flange portions and surrounding said elastomeric body portion, and an outer elastomeric cover member fitting over said ring member and the elastomeric body portion.

4,136,853

SLIDE VALVE

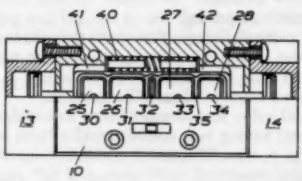
Folke L. Johansson, Malsryd, and B. F. Staffan Svenning, Fritsla, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation-in-part of Ser. No. 658,175, Feb. 17, 1976, abandoned. This application Apr. 19, 1976, Ser. No. 678,354

Claims priority, application Sweden, Feb. 24, 1975, 7502013

Int. Cl.[2] F16K *39/00*

U.S. Cl. 251—282 **23 Claims**



1. A flat-type slide valve comprising:

a housing provided with two substantially parallel, substantially flat contact surfaces, and fluid passages ending in at least one of said contact surfaces, said contact surfaces being rigid and immovable relative to each other in said housing;

a valve slide movably guided between said contact surfaces and having opposite substantially flat sides, each of said substantially flat sides cooperating with a respective one of said contact surfaces of said housing;

said valve slide having passage means for controlling fluid flow through said fluid passages of said housing and for pressure balancing the valve slide; and

seal rings carried on said opposite sides of said valve slide and encircling said passage means for maintaining sealing contact with said contact surfaces of the housing;

the improvement wherein:

each of said opposite sides of said valve slide has a plurality of grooves therein which do not communicate with the grooves on the opposite side of the valve slide, said seal rings being retained in said grooves in said valve slide;

each of said seal rings comprises a band-shaped contact member and a resilient support member;

the respective resilient support members and contact mem-

bers being located in different planes which are substantially parallel to each other as well as to one of said contact surfaces; and

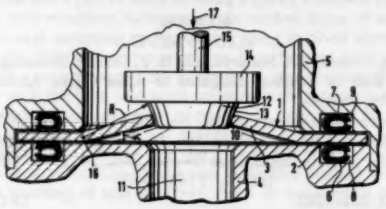
said resilient support members of each seal ring being located underneath its respective contact member and in a respective groove for resiliently biasing said respective contact member toward one of said contact surfaces by a force which is substantially uniformly distributed over the entire length of said respective contact member, said contact members being bendable so as to adapt to the adjacent contact surface to maintain sealing contact therewith, said resilient support members comprising the only biasing means for biasing said valve slide relative to said contact surfaces in a direction substantially perpendicular to said contact surfaces.

4,136,854

ALL-METAL LIFT VALVE FOR HIGH-VACUUM APPLICATIONS

Gerhard Ehmig, Feldkirch-Tosters, Austria, and Karl Vogt, Buchs, Switzerland, assignors to Vat Aktiengesellschaft fur Vakuum-Apparate-Technik, Haag, Switzerland

Filed Jun. 22, 1976, Ser. No. 698,338
Claims priority, application Switzerland, Jul. 1, 1975, 8557/75
Int. Cl.[2] F16K *1/38, 1/42, 51/02*
U.S. Cl. 251—333 **8 Claims**



1. A valve comprising:

(a) a housing defining a flow path therethrough;

(b) a valve seat member fixedly mounted in said housing and formed with an opening therethrough;

(c) a valve member of metallic material,

(1) said valve seat member being an annular disc of sheet metal having two opposite major faces and an annular edge portion of rounded contour connecting said major faces,

(2) said disc consisting essentially of an outer planar portion and an inner frustoconical portion terminating in said edge portion,

(3) said valve member having an annular sealing surface; and

(d) actuating means for moving said valve member relative to said valve seat member in a predetermined direction toward and away from a position in which said valve member closes said opening,

(1) said edge portion in said position engaging said surface substantially in line contact along a circle,

(2) said predetermined direction being obliquely inclined relative to said surface at an angle of less than 30° in all planes perpendicular to said circle,

(3) said two major faces defining a median line between said faces in each of said planes,

(4) each median line being substantially perpendicular to the engaged sealing surface in the corresponding plane,

(5) said sealing surface being a surface of rotation about an axis extending through the center of said circle in said predetermined direction, said surface tapering in the direction of movement of said valve member toward said position,

(6) said actuating means including means for applying to said edge portion and to said surface a contact pressure effective to maintain a tightness therebetween corresponding to a helium leakage of not more than 10^{-9} torr liter per second,

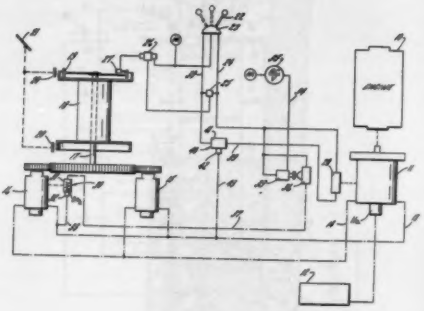
(7) said metallic materials resisting plastic deformation under the applied pressure.

4,136,855

HOIST DRUM DRIVE CONTROL

James G. Morrow, Sr.; David J. Pech, and Charles A. Hunter, II, all of Manitowoc, Wis., assignors to The Manitowoc Company Inc., Manitowoc, Wis.

Filed Dec. 3, 1976, Ser. No. 747,331
Int. Cl.[2] B66D *1/30*
U.S. Cl. 254—150 FH **3 Claims**



1. A hydraulic control system for a hoist drum drive comprising, in combination, an engine driven variable displacement pump, hydraulic motor means including a variable displacement motor and a fixed displacement motor both geared to the drum, hydraulic supply/return lines interconnecting said pump and said motor means in parallel, a pneumatic actuator for varying the displacement of the pump, said actuator being normally biased to zero displacement position, pneumatic control means for shifting said pump actuator to positive displacement during hoisting operation, a fluid actuator for varying the displacement of said variable displacement motor, said fluid actuator being normally biased to zero displacement condition and having a pneumatic section opposing said bias in one direction and a hydraulic section of reduced effective area opposing said bias in the opposite direction, means for communicating charge pressure from one of said supply lines to said hydraulic section to shift said actuator against said bias to maximum displacement condition, means for supplying air at a predetermined pressure to said pneumatic section to shift said actuator toward zero displacement condition, and means for communicating pressure from said supply line to said hydraulic section of said fluid actuator to increase the displacement of said motor means as the back pressure therein increases with increasing load on the drum.

4,136,856

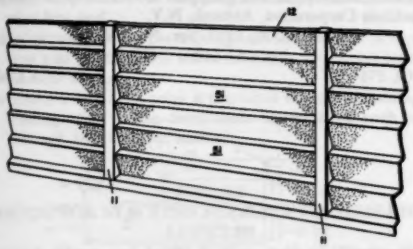
SOUND ATTENUATING STRUCTURE

Robert H. Murdock, Kensington, Calif., assignor to Custom Automatic, Richmond, Calif.

Filed Mar. 25, 1974, Ser. No. 454,689
Int. Cl.[2] E04H *17/16*
U.S. Cl. 256—24 **15 Claims**

1. A wall construction comprising spaced apart vertical support means, a plurality of panel sections each extending between adjacent vertical support means, each of said panel sections including a vertically disposed panel jamb at each end thereof, locking means including plate means adjustably spaced from and secured to each of said vertical support means for resiliently and compressively engaging therebetween each of said panel jambs, each of said panel sections including a

plurality of laterally disposed panel members vertically stacked in courses extending between a pair of said panel jambs, and



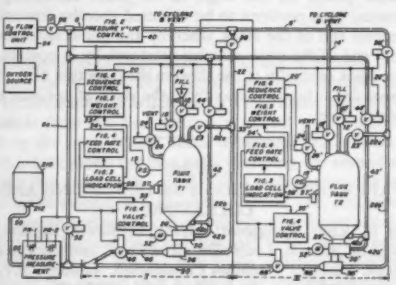
each of said courses including a pair of horizontally extending vertical sheets, said pair of sheets being parallel and spaced apart.

4,136,857

METHOD AND APPARATUS FOR AUTOMATICALLY CONTROLLING THE RATE OF FLUX INJECTION TO A CONVERTER

William A. Kolb, Forest Hills, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 346,555, Mar. 30, 1973, abandoned. This application Apr. 8, 1975, Ser. No. 566,588
Int. Cl.² C21L *5/34*
U.S. Cl. 266—80 **13 Claims**



1. In combination a steel-refining converter of the type having at least one tuyere at the bottom thereof through which fluid under pressure is supplied to said converter and an apparatus for controlling the injection of flux into said converter, said apparatus having:

(a) conduit means for supplying fluid at a predetermined pressure to said converter;

(b) a flux-containing tank coupled to said conduit means for injecting flux into said fluid;

(c) means for pressurizing the interior of said tank;

(d) valve means interposed between said tank and said conduit means, said valve means having a variable orifice for regulating the rate of which flux flows out of the tank and into said conduit means;

(e) comparison means for comparing the actual amount of flux remaining in said tank at any given time with a predetermined reference amount which should remain in said tank for such given time; and

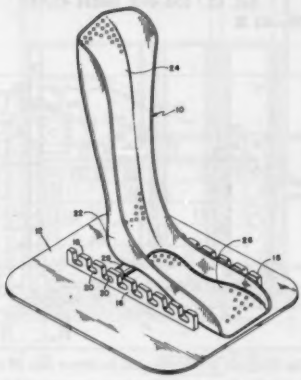
(f) means coupled to said comparison means for controlling the opening of said variable orifice as a function of the difference between said actual and reference amounts.

4,136,858

SURGICAL KNEE HOLDER

Thomas D. Petersen, La Mesa, Calif., assignor to Alvarado Orthopedic Research, Inc., La Mesa, Calif.

Filed Feb. 27, 1978, Ser. No. 881,356
Int. Cl.² A61F *5/04*
U.S. Cl. 269—328 **8 Claims**



1. A knee holder for positioning the knee of an individual into position for surgery, said holder comprising in combination:

a base plate for securing in a fixed position on an operating table, said plate having a generally flat bottom and a generally flat top and multiple connecting means on the top thereof, and

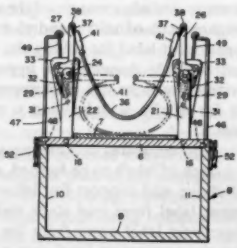
a bracket including a leg brace means for receiving and connecting to the lower leg and the foot of a patient, said bracket including pivotal connecting means having a single pivot axis for selectively engaging and pivotally connecting said bracket to said first connecting means for pivotal movement about said single pivot axis and for relative adjustment of the bracket along the base plate for supporting a leg in selected bent positions.

4,136,859

INFANT HOLDER

Gary F. Hulbert, 700 Robertson Way, Sacramento, Calif. 95818

Filed Aug. 4, 1978, Ser. No. 930,911
Int. Cl.² A61G *13/00*
U.S. Cl. 269—328 **8 Claims**

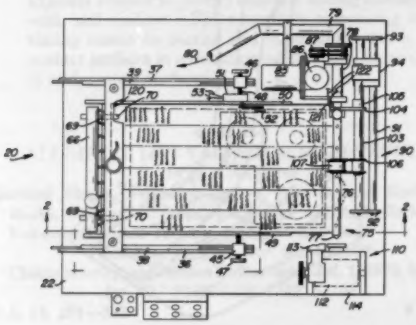


1. An infant holder comprising a table, a pair of uprights disposed opposite each other at the sides of said table, a pair of arms, means for mounting said arms on respective ones of said uprights for pivotal motion between opposite sides of central positions, means for urging said arms away from said central positions, and a strap at its opposite ends secured to the ends of said arms and of a length to be spaced above said table when said arms are in said central positions.

4,136,860
METHOD AND APPARATUS FOR MANUFACTURE OF ROLLED INFORMATION LABEL

James H. Shacklett, Jr., 2025 Joshua Rd., Lafayette Hill, Pa. 19444, and Charles W. Bittner, Cherry Hill, N.J., assignors to James H. Shacklett, Jr., Lafayette Hill, Pa.

Filed Mar. 4, 1977, Ser. No. 774,521
Int. Cl.[2] 156 *446*; B65H *45/00*
U.S. Cl. 270—61 R 17 Claims



1. A label-folding apparatus comprising an upwardly facing horizontally fixed support for a stack of labels to be folded, said support being vertically shiftable to locate the uppermost label of a stack at a predetermined level, a mandrel adjacent to said support and fixed vertically for predetermined spacing above said predetermined level for adherently engaging one portion of the uppermost label from a stack on said support to free the uppermost label from the next uppermost label, said mandrel being rotatable for simultaneously drawing the uppermost label across the next uppermost label and rolling the uppermost label into a tube about said mandrel, and creasing rolls having a nip adjacent to one end of said mandrel for rolling engagement in the nip of a tube on said mandrel and simultaneous withdrawal therefrom of a rolled label tube and creasing the same to a flat configuration.

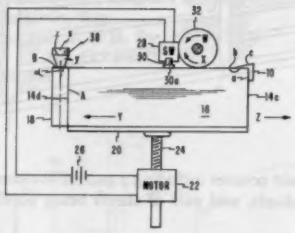
13. A label-forming apparatus comprising an upwardly facing support for a stack of labels to be formed, a rotary mandrel adjacent to and spaced above said support and having its axis fixed horizontally relative to said support, vacuum gripping means associated with said mandrel for gripping engagement with an uppermost label from said stack to simultaneously draw the uppermost label upwardly and horizontally away from the next uppermost label and roll the uppermost label into a tube about said mandrel, said mandrel being fixedly spaced above and adjacent to one edge margin of the stack of labels to be rolled for engagement of said mandrel to said one edge margin of the uppermost label for rolling the uppermost label about said mandrel while drawing the uppermost label upwardly and horizontally from the next uppermost label, and stripping means for axially withdrawing a rolled label tube from the mandrel.

14. A label-forming apparatus comprising an upwardly facing support for a stack of labels to be formed, a rotary mandrel adjacent to and above said support for adherent engagement with an uppermost label from said stack and simultaneously drawing the uppermost label away from the next uppermost label and rolling the uppermost label into a tube about said mandrel, said mandrel being adjacent to one edge margin of the stack of labels to be rolled, vacuum means communicable through said mandrel to effect said adherent engagement thereto of said one edge margin of the uppermost label for rolling of the uppermost label about said mandrel, stripping means for axially withdrawing a rolled label tube from the mandrel, and adhesive applying means spaced from said mandrel for applying adhesive to a label edge margin remote from said one edge margin.

4,136,861
PAPER GUIDE MEANS FOR REVERSE FEED SHEET PAPER SEPARATION DEVICE

Willie Goff, Jr., Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 30, 1977, Ser. No. 838,434
Int. Cl.[2] B65H *3/30*
U.S. Cl. 271—22 8 Claims



1. A separator for separating the pliant sheet on a first end of a stack of such sheets from the stack, said first end and also a second opposite end of the stack each being defined by a single one of said sheets and a face of said stack being defined by aligned edges of the sheets in said stack, said separator comprising:

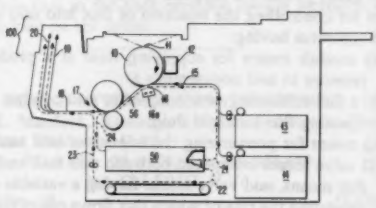
a pair of stationary posts positioned at said face of the stack and each of the posts including a conical portion in alignment with said pliant sheet on said first end of the stack and tapering to smaller diameter along said face of the stack toward said second end of the stack, and

sheet drive means operable centrally of said pliant sheet on said first end of the stack to move this sheet toward and into contact with said conical post portions to thereby cause points on the edge of the sheet contacting said conical post portions to be cammed thereby toward said second end of the stack whereby the pliant sheet on said first end of the stack remains substantially in contact with the stack centrally of the sheet in the direction of its movement and is bowed away from the stack at opposite edges of the sheet.

4,136,862
PAPER ORIENTATION FOR DUPLEXING AND COLLATING

Barton H. Kunz, Longmont; Myron F. Shlatz, Boulder, and Lowell M. Simson, Louisville, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1977, Ser. No. 787,140
Int. Cl.[2] B65H *29/00*
U.S. Cl. 271—186 6 Claims



1. In a document copier machine wherein an electrostatic image is placed upon a copy sheet at a transfer station and said image is fused to said copy sheet at a fusing station, apparatus for automatically providing duplexed copies comprising:

guide means for receiving a simplexed copy sheet from said fusing station and guiding said copy sheet around a 180° bend into a first direction and onto a receiving tray;

first stop means for stopping said copy sheet in said tray;

turnaround means for moving said copy sheet at 90° to said first direction and guiding said sheet around a 180° bend into a duplex bin;

second stop means for stopping said copy sheet in said duplex bin; and

sheet moving means for moving said sheet in said first direction and guiding said sheet around a 180° bend into said transfer station,

whereby a duplexed copy is provided while maintaining the leading edge of the copy sheet constant for both passes through said transfer station.

4,136,863

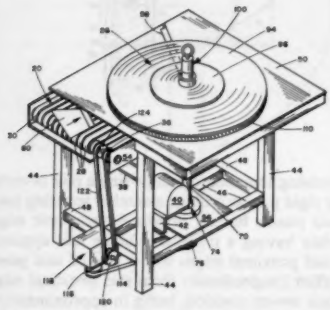
SYSTEM FOR STACKING FLEXIBLE OR SEMI-RIGID ARTICLES

Donald A. Sloan, and James F. King, both of Winston-Salem, N.C., assignors to Hanes Corporation, Winston-Salem, N.C.

Filed Nov. 7, 1977, Ser. No. 849,103

Int. Cl.² B65H *31/08*

U.S. Cl. 271—212 **19 Claims**



1. The method of assembling a plurality of flexible or semi-rigid articles in vertically aligned condition comprising the steps of: advancing an article along a first linear path, elevating the article from the first path to a second path, rotating the article in the second path about a vertical axis, advancing a second article along the first path, elevating the second article from the first path to the second path and rotating the second article in the second path about the vertical axis, and repeating the steps with additional articles where subsequent articles are sequentially elevated from the first path to the second path and positioned beneath articles previously positioned within and rotating in the second path to stack the articles vertically.

4,136,864

SHEET STACKING DEVICE

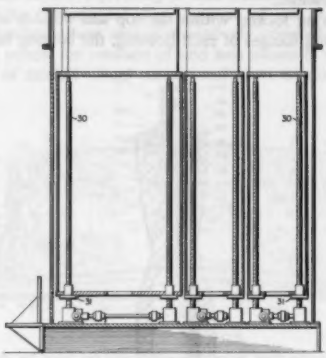
David N. Obenshain, Swanton, Md., assignor to Westvaco Corporation, New York, N.Y.

Filed Jun. 16, 1977, Ser. No. 807,115

Int. Cl.² B65H *31/10, 31/20*

U.S. Cl. 271—217 **2 Claims**

1. A sheet receiving and stacking means for a fixed height sheet delivery device comprising a stack supporting skid lift assembly consisting of a plurality of skid lift sections arranged adjacent to one another at the delivery end of said sheet delivery device, a jogger rail assembly including joggers located adjacent to said skid lift assembly for successively aligning the edges of sheets being stacked, means for adjusting said jogger rail assembly for stacking a wide range of sheet sizes and a means for automatically lowering the skid lift assembly to accomodate the increasing height of the stack as sheets are deposited thereon, the improvement comprising means for stacking a wide range of sheet sizes wherein each skid lift section includes means for independently adjusting its vertical height, said means comprising a plurality of driven means comprising screws which drivingly engage ball nuts mounted on the base of each skid lift section to provide the source of vertical movement, a separate clutch assembly connected to the plural driven means for each skid lift section, a primary drive means connected to said clutch assemblies for providing



gross changes in the vertical height of the skid lift sections and a secondary drive means connected to said clutch assemblies for automatically lowering the skid lift sections to accomodate the increasing height of the stack as sheets are deposited thereon.

4,136,865

SHEET FEEDING APPARATUS

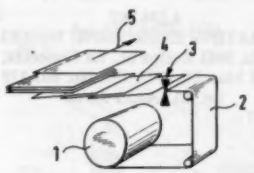
Josef Marass, Seehausen, Fed. Rep. of Germany, assignor to Georg Spless GmbH, Gersthofen, Fed. Rep. of Germany

Filed Aug. 19, 1977, Ser. No. 825,949

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638783

Int. Cl.² B65H *5/34*

U.S. Cl. 271—270 **20 Claims**



1. A sheet feeding apparatus with a cross-cutter in front; withdrawal devices; means following said cross-cutter for forming a series of underlapping sheets and having lifting and holding elements in a region between two withdrawal devices driven at different feed speeds; said elements lifting the rear end of each sheet to form a lead-in gap for the following sheet; continually driven rotating transport elements; said lifting and holding elements being fastened to said transport elements and being kept on a straight path in the engagement area slightly delayed relative to the following withdrawal device, the effect of said different feed speeds being compensated by a relative movement between said sheets and said holding elements.

4,136,866

SKIP ROPE

Ronald O. Bouvier, 91 Woodland Rd., Holden, Mass. 01520

Filed Sep. 29, 1977, Ser. No. 837,926

Int. Cl.² A63B *5/20*

U.S. Cl. 272—75 **4 Claims**

1. Skip rope, comprising:

(a) a pair of handles, each handle having a bore at one end,

(b) a tubular housing for insertion in the bore of each handle in a snug fit, the housing having top and bottom inwardly-extending flanges, and a top outwardly extending flange located in the same plane as the top inwardly-extending flange, thus forming a stop when the housing is imbedded in the handle,

(c) a bearing locked within the top and bottom inwardly-extending flanges of each housing, the bearing having an

outer race locked against rotation and an inner race separated from the outer race by anti-friction elements and having a central bore, the inner race being elongated with respect to the outer race and protruding externally of the housing and handle, and

(d) an elongated rope, each end of the rope running through the central bore of one of said inner races, the end of the rope being held in place by an enlargement at its end.

4,136,867

VIBRATING EXERCISING WHEEL

Douglas G. Wilkin, 3061 Evelyn St., La Crescenta, Calif. 91214

Filed May 31, 1977, Ser. No. 802,178
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—127 7 Claims

1. A wheel exerciser for use with a floor having a surface:

(a) a wheel body having an axis said wheel body having a series of protuberances forming a noncircular periphery each of said protuberances having an edge extending in a direction substantially parallel to said axis;

(b) a pair of pads on opposite sides of the wheel body;

(c) means connecting the pads to the center of the wheel body and permitting relative rotation between the wheel body and said pads said means being substantially rigid to prevent lateral deflection of said pads;

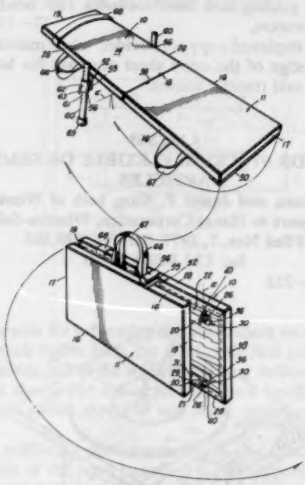
(d) each said protuberance being separated from the next protuberance by an opening, rotation of said wheel body by a user causing vibrations to be imposed upon said pads through said wheel body and through said rigid connecting means as said wheel body is moved along a floor surface or the like during an excercise program.

4,136,868

EXERCISING SLANT BOARD

Charles J. Hogue, Box 449, Piedmont, Ala. 36272

Filed May 31, 1977, Ser. No. 801,593
Int. Cl.[2] A63B *23/02*
U.S. Cl. 272—144 10 Claims



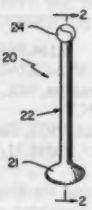
1. An exercising slant board comprising a pair of rectangular substantially rigid panels; a hinge assembly securing said panels together, said panels having proximal transverse edges, said hinge assembly having a transverse hinge axis approximately parallel to said proximal edges below one of said panels, said axis being offset longitudinally from said proximal edges; said panels, in their set-up position, being in approximately a common plane with their proximal edges in abutting relationship, said panels being pivotable about said transverse axis to a folded position adjacent to each other; and leg means for supporting sand slant board.

4,136,869

BALL TEE

Joseph V. Tassone, 2425 Rawnsdale Rd., Kettering, Ohio 45440

Continuation of Ser. No. 517,895, Oct. 25, 1974, abandoned, which is a division of Ser. No. 258,863, Jun. 1, 1972, Pat. No. 3,853,878. This application Sep. 7, 1976, Ser. No. 721,060
Int. Cl.[2] A63B *69/40*
U.S. Cl. 273—26 R 1 Claim



1. A baseball and softball type ball tee comprising, a base and an upstanding column carried by said base and having means for supporting a ball having an external diameter within the range of the diameter of a standard baseball to the diameter of a standard softball, said base and column being a single-piece construction and being dimensioned to enable said tee to be knocked over easily, said column having a vertical dimension which is substantially greater than the largest horizontal dimension of said base, said base and column being substantially entirely of a yieldable resilient elastomeric material, said base and column being hollow and each being of substantially uni-

form wall thickness throughout its vertical height, said column being adapted to be struck by said ball bat with said column and bat remaining intact and said base and column being adapted to be easily flattened transverse a longitudinal axis therethrough upon applying compressive forces thereagainst to thereby assure a person falling thereon will be free of injury, said hollow base having a substantially cup-shaped configuration terminating in a bottom annular supporting edge, said column having a vertical dimension which is at least several times greater than the diameter of said softball.

4,136,870

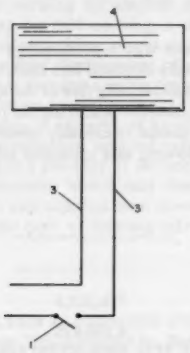
SCORE KEEPING METHODS

Vernon Kinser, Box 157A, Rte. 1, Jenkins, Mo. 65677

Filed Feb. 18, 1977, Ser. No. 770,278

Int. Cl.[2] A63D *5/00*

U.S. Cl. 273—54 C **2 Claims**



1. A method for promoting accuracy in score keeping in the game of bowling wherein there is utilized a bowling alley, a bowling pin-setting machine, a remote controller for said pin-setting machine, a bowling ball return chute, a counting mechanism provided in said chute for progressively indicating the balls returned whereby the total number of rolls may be immediately ascertained, and a score keeping sheet having discrete, delineated portions for receiving the score of each ball, said method comprising ascertaining the number of pins remaining after opponent player's play, placing such opponent player's score for such play within the portion of said score keeping sheet corresponding to the particular turn, then operating said controller to effect resetting of the pins for the next player's play, and comparing the number indicated on the counting mechanism with the number of rolls determinable by reference to the score sheet to establish the correct portion of said sheet for the succeeding score reception.

4,136,871

ROTARY TABLE BALL GAME

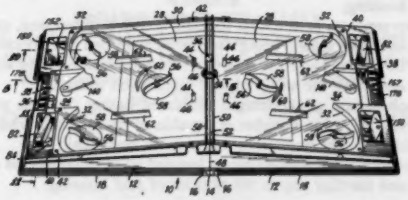
Michael R. Meyers, Trumbull, Conn.; Michael Langieri, Butler, N.J., and Calvin Cook, Erie, Pa., assignors to Louis Marx & Co., Inc., Stamford, Conn.

Filed Dec. 20, 1976, Ser. No. 752,338

Int. Cl.[2] A63F *7/06*

U.S. Cl. 273—85 A **23 Claims**

1. A table ball game for use with a game-piece comprising a playing surface; at least two arms for projecting said game-piece across said playing surface; axis means for rotatably mounting each said arm on said playing surface, each said arm extending radially from each said axis means across said playing surface, each said arm curving outwardly from said axis so that the concave portion of the curve faces in the direction of rotation, means for selectively rotating said arm about said axis in said direction, said rotating means including angularly manipulatable arm control means and means operatively coupling said arm control means and at least two axis means for coordinately rotating said arms in response to the manual manipulation of said arm control means, said coupling means including a pivotably mounted transmission member; means operatively connecting said arm control means and said transmission member for the selective pivoting of said transmission member in response to the manual displacement of said arm control means; ratchet wheel means operatively coupled to each of said axis means for rotation of said axis means in response to rotation of ratchet wheel means; and pawl means associated



with each of said ratchet wheel means and coupled to said transmission member for displacement from a first point on one side of said ratchet wheel means past said ratchet wheel means to a point on the other side of said ratchet wheel means and back to said first point in response to the pivotable displacement of said transmission member, said ratchet wheel means and pawl means being adapted for rotation of said ratchet wheel means, and therefore the associated axis means and arm only during the displacement of said pawl means from said first point to said second point.

4,136,872

GAME EMPLOYING LIQUID MOVEMENT TO MOVE A PLAYING PIECE

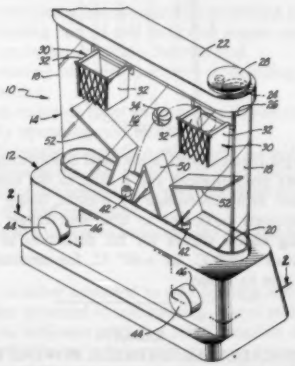
Takao Matsumoto, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed May 18, 1977, Ser. No. 798,235

Claims priority, application Japan, May 26, 1976, 51/67979[U]

Int. Cl.[2] A63F *7/06*

U.S. Cl. 273—85 H **5 Claims**



1. A game having a transparent housing, a liquid located within said housing, a movable member having a specific gravity greater than the specific gravity of said liquid located within said housing in said liquid, and means for circulating said liquid within said housing so as to move said movable member in which the improvement comprises:

said game having two of said circulation means,

each of said circulation means being capable of being independently operated so as to remove liquid from the inte-

rior of said housing and so as to eject a stream of said liquid into the interior of said housing at variable rates,

each of said circulation means having a nozzle directed into the interior of said housing for ejecting a stream of said liquid into the interior of said housing,

said nozzles being located separate and apart from one another and being located relative to one another so that said circulation means are capable of being operated to cause currents within said housing for moving said movable member which vary and which interfere with one another,

said nozzles being directed to a common point within said housing,

two separate goal means located within said housing, one of said goal means being associated with one of said circulation means and the other of said goal means being associated with the other of said circulation means,

each of said goals being a simulated basket through which said movable member is capable of passing and wherein

said movable member is a simulated basketball,

said simulated baskets being located so as to be spaced from one another above the bottom of said housing.

4,136,873

TARGETS AND MATERIALS THEREFOR

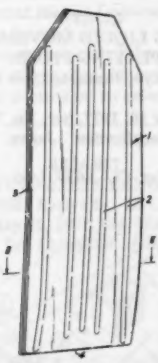
William H. Bowyer, Farnham, England, assignor to Australasian Training Aids Pty. Ltd., Albury, Australia

Continuation of Ser. No. 590,214, Jun. 25, 1975, abandoned. This application Jul. 12, 1976, Ser. No. 704,551

Claims priority, application United Kingdom, Jun. 28, 1974, 28956/74

Int. Cl.² F41J *1/02*

U.S. Cl. 273—102 B **8 Claims**



1. A target formed from a material comprising a mixture of high density polyethylene and a filler in the form of talc, the talc content, as a percentage by weight, being 10 percent or less, in amounts sufficient so that said target is capable of transmitting shock waves for hit detection in temperatures ranging from −20° C. to +60° C. for ammunition ranging from 5.65 mm to 9 mm.

4,136,874

VERTICALLY ADJUSTABLE BOVINE ROPING PRACTICE APPARATUS

Kenneth J. McCord, 1725 W. Eva, Phoenix, Ariz. 85021

Filed Aug. 12, 1977, Ser. No. 824,002

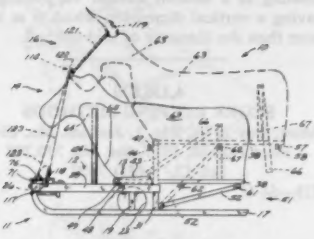
Int. Cl.² A63K *3/00*; A63B *69/00*

U.S. Cl. 273—105.2 **9 Claims**

1. A bovine roping practice apparatus comprising:

(a) a ground engaging means for translational movement along the ground;

(b) a super structure connected to said ground engaging means and selectively movable vertically between a stable first and a stable second position, means to secure said super structure in said first and second positions; wherein said first position approximates the height and appearance of a calf suitable for practicing the roping of calves, and said second position approximates the height and appearance of a steer, said super structure in said second position



having rearward legs approximating the legs of a steer with downwardly disposed free ends, which free ends are also disposed substantially free of the apparatus and above the ground suitable for practicing the roping of steers; and

(c) a tow-cable means releaseably connected to said super structure for towing said apparatus along the ground.

4,136,875

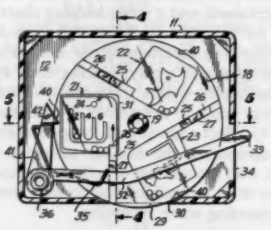
MULTI-GAME TOY MOUNTED ON TURNTABLE

Frank Kohner; Ralph Stern, and Albert Stubbmann, all of Teaneck, N.J., assignors to Wecolite Co., Inc., Teaneck, N.J.

Filed Jul. 27, 1977, Ser. No. 819,493

Int. Cl.² A63F *7/00*

U.S. Cl. 273—121 R **14 Claims**



1. A multi-game toy comprising:

(a) a housing having a predetermined game-playing location;

(b) a turnable support mounted on said housing for turning movement about an axis;

(c) a plurality of games each having a playing field of predetermined size and a toy element to be displaced for playing the respective game, said games being spaced about said axis on said support and being movable with the latter for registration of any selected one of said games at said predetermined location;

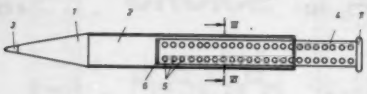
(d) actuating means at said predetermined game-playing location for displacing said toy element of the selected game to play the latter; and

(e) means for enlarging the view of the playing field to a size larger than said predetermined size, said enlarging means including a magnifier lens mounted on said housing at a position remote from said predetermined location.

4,136,876
VARIABLE NUMERICAL SELECTION APPARATUS

Albert Kaplan, Aesch, Block E, CH-8834 Schindellegi, Switzerland

Filed Feb. 10, 1977, Ser. No. 767,534
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629343
Int. Cl.[2] A63F 7/04
U.S. Cl. 273—138 R 11 Claims



1. A numerical selection apparatus comprising a casing, means forming an interior chamber of said casing, and including an opening for viewing the interior of said chamber, a transparent covering for said opening, a slide longitudinally movable relatively to said casing, means exterior to said casing for effecting longitudinal displacement of said slide to a preferred position means forming a guide opening by which said slide is movable relative to said casing through the guidance opening of said casing, a plurality of locating means on said slide, each having a numerical assigned value and adapted for games of chance, and a plurality of surface projectiles which are randomly positionable within said chamber and on said locating means after said slide has been moved to a preselected position to select the ratio of locating means to said surface projectiles.

4,136,877
GOLF CLUB ALIGNMENT SYSTEM

Anthony J. Antonious, 7005 Lachlan Cir., Baltimore, Md. 21239

Continuation-in-part of Ser. No. 649,897, Jan. 16, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 761,860
Int. Cl.[2] A63B 53/04
U.S. Cl. 273—164 16 Claims

1. A golf clubhead of the putter type having a putter blade with a frontal striking face, a rear face and at least one upper surface and at least one lower surface comprising;

one single visual precision alignment means creating one single sighting image at one single focal point for providing both lie and loft alignment of said clubhead including:

(a) inner indicia located on one of said surfaces forming a dominant central image having at least two inner directional marks, one of said marks being parallel to said striking face and a second of said marks being perpendicular to said striking face,

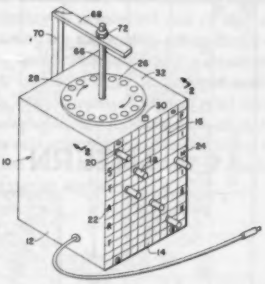
(b) outer indicia positioned outside of said inner indicia and located on the other of said surfaces vertically spaced from and complementary to said inner indicia, said outer indicia having at least one outer directional mark in the same linear direction as each of said two inner directional marks, one of said outer marks being parallel to said striking face and a second of said outer marks being perpendicular to said striking face, and

(c) said inner indicia extend outwardly to interface with said complementary outer indicia creating a visual in-line outwardly radiating extension of said dominant central image appearing as one enlarged image when said inner indicia and said outer indicia are interfaced clearly presenting a single sighting image at one single focal point so that the user may establish precision alignment for both lie and loft indicating when the clubhead is properly soled.

4,136,878
BOARD GAME APPARATUS

Ben L. Caldwell, 7640 S. Vernon Ave., Chicago, Ill. 60619

Continuation of Ser. No. 695,580, Jun. 14, 1976, abandoned. This application May 11, 1977, Ser. No. 795,967
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—237 9 Claims



1. An amusement device comprising:

a housing,

a gameboard on a surface of said housing receiving a plurality of pegs which are manually moved sequentially on said gameboard from one position to another, and

chance apparatus on said housing for determining which of said pegs is to be moved on said gameboard, said chance apparatus including

a rotatable disc having a plurality of indicator means spaced about its periphery and each corresponding to one of said pegs,

a stationary member adjacent said disc providing a reference site fo selecting one of said indicator means on said disc which stops in juxtaposition thereto, and

means for rotating said disc, said means including

an electric motor,

switch means movable from an open to a closed position for electrically operating said motor,

means for drivingly connecting said motor to said disc, and

means for continuing the rotation of said disc after said switch means is opened to increase the element of chance provided by said apparatus.

9. A portable self-powered rotational toy apparatus comprising:

a housing;

a rotational member mounted to said housing and a stationary member mounted to said housing, one of said members defining an indicator and the other member defining a plurality of different indicia, said members being mounted and rotational relative to one another so that said indicator will indicate one of the plurality of indicia after rotation of the rotary member stops;

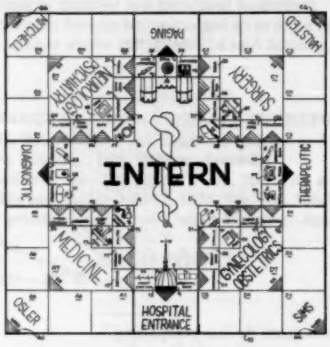
an electric motor mounted to said housing and coupled to drive said rotating member;

an electric storage battery means mounted in said housing, for serving as the source of power for the electric motor;

a manually operable switch means operably associated with said battery and said motor for controlling said motor such that the rotational member may be selectively ro-

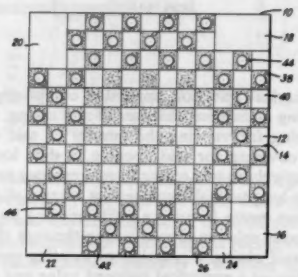
tated for a period by operating the switch means and afterward allowed to stop to indicate one of the indicia, said switch means including a switch connected by a length of electric cord to the housing whereby control of the apparatus may be had by one of a number of players positioned about the housing, without having to touch the housing and the switch may be easily passed to other players and wherein sound generating means are provided in the housing which are controlled to sound whenever the motor is energized.

4,136,879
INTERN BOARD GAME
Clifford G. Andrew, and Louise B. Andrew, both of 555 Brook Rd., Towson, Md. 21204
Filed Sep. 30, 1977, Ser. No. 838,062
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—243 **9 Claims**



1. A board game apparatus for a game to be played by a plurality of players, said apparatus comprising:
a plurality of playing pieces, one for each player;
a playing board having a plurality of marked sequential spaces constituting a playing path to be traversed by said playing pieces;
means associated with the majority of said sequential spaces for identifying them as different patient symptom spaces, said patient symptom spaces including: a first plurality of spaces marked to additionally identify them with a first medical speciality; and a second plurality of spaces marked to additionally identify them with a second medical speciality;
means associated with a first majority of said sequential spaces for identifying them as diagnosis spaces;
means associated with a second minority of said sequential spaces for identifying them as treatment spaces;
change-determining means responsive to actuation by each player for indicating a number of said sequential spaces to be traversed by that player's piece in one turn;
a plurality of diagnostic cards, at least one for each of said patient symptom spaces, each identifying the patient symptom corresponding to a patient symptom space and a diagnosis for that patient symptom;
a plurality of treatment cards, at least one for each of said diagnosis cards, each identifying a patient diagnosis and symptom corresponding to a patient symptom space and a treatment for that patient diagnosis;
whereby each player is assigned a medical specialty and is entitled to admit a patient for diagnosis when the player's piece lands on a patient symptom space marked with that player's medical specialty, is entitled to collect diagnostic cards when said playing piece lands on a diagnosis spaces, is entitled to diagnose a patient when a collected diagnosis card corresponds to the symptom of an admitted patient, is entitled to collect treatment cards when said playing piece lands on treatment spaces, and is entitled to treat and discharge a patient when a collected treatment card corresponds to the symptom and diagnosis of an admitted patient.

4,136,880
FOUR HAND CHECKERBOARD
Eli Rikon, 141-47 70th Rd., Flushing, N.Y. 11367
Filed Jul. 26, 1977, Ser. No. 819,128
Int. Cl.[2] A63F 3/02
U.S. Cl. 273—261 **4 Claims**

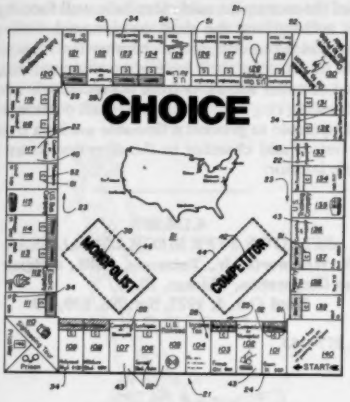


1. A game comprising a gameboard having a square playing field divided into a checkerboard arrangement of $2n + 1$ playing squares along rows and columns of the playing field, wherein n is an integer equal to or larger than 6, said playing squares being alternately identified by contrasting colors, alternate ones of the playing squares being playing piece receiving squares with the rest of the playing squares being spacing squares, the four corners of said square playing field being devoid of said checkerboard arrangement of which a first diagonally opposed pair of corners each occupy the space of three columns and two rows of playing squares and the other diagonally opposed pair of corners each occupy the space of two columns and three rows of playing squares, with the exception of said corners said checkerboard arrangement being uniform throughout the playing field, the corners being arranged such that a player facing any side of the gameboard has the left hand corner devoid of playing squares in the area of two vertical and three horizontal playing squares and the right hand corner devoid of playing squares in the area of three vertical and two horizontal playing squares, the checkerboard arrangement being such that the respective first playing squares on the playing field along an imaginary diagonal line crossing each of said four corners is a playing piece receiving square, and four sets of playing pieces, each set being distinguishable from the other of said sets, each playing piece fitting within a playing square.

4,136,881
GAME EQUIPMENT AND METHOD HAVING SIMULTANEOUSLY PLAYED, BALANCED, MULTIPLE GAME THEORIES
Ralph Anspach, 1060 Keith Ave., Berkeley, Calif. 94708
Filed Jan. 31, 1977, Ser. No. 763,815
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—256 **12 Claims**

1. Game equipment including game format means, a plurality of player identification means formed for use with said format means, and probability determining means formed to control play of a game under a first game conduct theory by a first player and to control play of said game under a second different game conduct theory by a second player, said probability determining means being provided on at least one of said format means and reference means associated with said format means, wherein the improvement in said game equipment comprises:
said probability determining means being formed so that the

probability of winning said game by said first player playing under said first game conduct theory as controlled by said probability determining means is statistically equal to



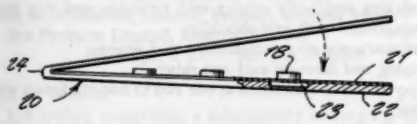
the probability of winning said game by said second player playing under said second different game conduct theory as controlled by said probability determining means.

4,136,882

DOMAIN GAME WITH ELASTIC PIECE RETENTION

Besir Odza, Geòrge Spector, both c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Aug. 16, 1976, Ser. No. 714,817
Int. Cl.[2] A63F 3/00
U.S. Cl. 273—264 1 Claim



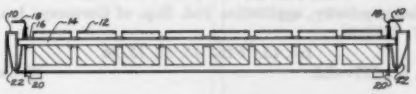
1. A DOMAIN GAME, comprising in combination a game board having a playing field imprinted on one side consisting of three concentric squares with interconnecting cross lines at a center of each side thereof, and a set of eighteen playing pieces divided into two differently colored teams of nine pieces each wherein said board comprises a pair of panels which fold together along a central line including an emperforate, elastic sheet mounted flush on one panel, said elastic sheet having said playing field imprinted thereon and said one panel having a depression under each complete playing space of said playing field, said depressions being slightly larger than the playing pieces in circumference and of depth equal to the combined depth of a piece and thickness of said sheet whereby said panels are movable from an open playing position in which said pieces rest on said elastic sheet to a closed storage position wherein some of the playing pieces are forced into said depressions when the second panel engages the pieces to thereby retain them in said depressions with the pieces being flush with the second said panel and playing field.

4,136,883

GAME BOARD APPARATUS

Garry W. Klees, 9130 SE. 72nd Pl., Mercer Island, Wash. 98040

Filed Dec. 5, 1977, Ser. No. 857,213
Int. Cl.[2] A63F 3/00; G09B 1/20
U.S. Cl. 273—281 8 Claims



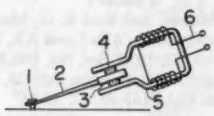
1. A game and display board mechanism comprising: an enclosed frame; a plurality of shafts aligned parallel to each other and extending from a first to an opposite side of said frame; a plurality of blocks mounted for rotational movement on each of said shafts; said blocks each having a plurality of exterior surfaces and a weighted lobe located within each block to cause the display of a selected one of said exterior surfaces when said blocks are allowed to rotate freely on said shafts; biasing spring means for providing a predetermined force acting on each of said blocks to prevent inadvertent rotational movement; and manually actuated reset means for relieving said predetermined force to allow each of said blocks that are not displaying said selected one of said exterior faces to rotate under the action of its weighted lobe to display said selected one of said exterior surfaces.

4,136,884

ELECTROMAGNET TYPE PICKUP DEVICE

Motoi Iyeta, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 18, 1977, Ser. No. 778,928
Claims priority, application Japan, Mar. 18, 1976, 51-29548
Int. Cl.[2] G11B 3/02; H04R 1/16
U.S. Cl. 274—37 8 Claims



1. An electromagnet type pickup device comprising:

a cantilever carrying a stylus at one end;

a vibrating element securely receiving the other end of said cantilever;

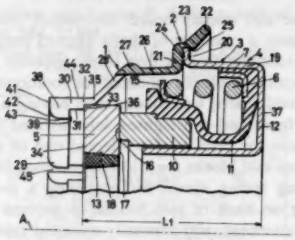
an elongated metallic member supporting said vibrating element under tension, said member comprising a first portion of a relatively small diameter and a teardrop-shaped second portion of a relatively large diameter which is integral with said first portion and formed by melting one end of said member to produce the teardrop shape, said second portion being securely received in said vibrating element and said first portion extending through and beyond said vibrating element in a direction opposite to said cantilever; and

means engaging said second portion to maintain the elongated member in tension.

4,136,885
AXIAL SHAFT SEALING UNIT FOR SEALING A STATIONARY MACHINE PART RELATIVE TO A ROTATABLE MACHINE PART

Klaus-Jürgen Uhrner, Leingarten, Fed. Rep. of Germany, assignor to Kupfer-Asbest-Co. Gustav Bach, Heilbronn, Fed. Rep. of Germany

Filed Jan. 25, 1978, Ser. No. 872,059
Claims priority, application Fed. Rep. of Germany, Jan. 26, 1977, 2703104
Int. Cl.² F16J 15/18, 15/36
U.S. Cl. 277—9.5 **18 Claims**

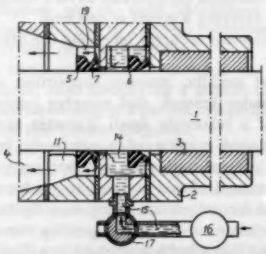


1. An axial shaft sealing unit for sealing a stationary machine part relative to a rotatable machine part, especially a pump shaft, which includes: a slide ring seal adapted to be mounted on a stationary machine part in a sealing manner and comprising a housing with a bottom surface located transversely to the slide ring seal axis, a primary seal forming a sliding ring and having a sealing surface; a bellows-like secondary seal, and compression spring means arranged between said primary seal and said housing bottom surface; a counter ring connectible to said rotatable machine part in a rotation-proof manner and resting with said counter sealing surface against said sealing surface of said primary seal; a holder interconnecting said counter ring and said slide ring seal; said counter ring and said slide ring being coaxially arranged with regard to each other; said bellows-like secondary seal being vulcanized in a position corresponding substantially to its installed position and being held in said last mentioned position by said holder; said holder being detachable; and a machine component for non-rotatable connection to the rotatable machine part; said counter ring resting directly against said machine component.

4,136,886
ARRANGEMENT FOR CLEANING A SEALING RING ON A SHAFT

Claes B. Sjoholm, Malmo, and Karl J. G. Martensson, Lund, both of Sweden, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Feb. 23, 1978, Ser. No. 880,363
Claims priority, application Sweden, Feb. 25, 1977, 7702087
Int. Cl.² F16J 15/32, 15/40
U.S. Cl. 277—24 **6 Claims**

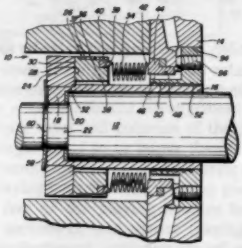


1. The combination of a receptacle having a wall, a rotatable shaft passing through said wall into the interior of the receptacle, a first sealing ring surrounding the shaft, said ring being of the type which prevents a flowable medium from forcing its way from the interior of the receptacle past the ring but allows a flowable medium to force its way past the ring into the interior of the receptacle, said receptacle wall forming a closed chamber surrounding the shaft outside said sealing ring, a device connected to said closed chamber for supplying cleaning liquid thereto, the shaft having a portion extending out of the closed chamber and away from the receptacle interior, and a second sealing ring surrounding said shaft portion within said wall and operable to prevent a flowable medium from forcing its way out of said chamber in the direction away from the receptacle interior.

4,136,887
BELLOWS TYPE MECHANICAL SEAL

Robert S. Wentworth, Jr., Temecula, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 4, 1977, Ser. No. 839,479
Int. Cl.² F16J 15/36
U.S. Cl. 277—43 **4 Claims**



1. A mechanical seal assembly adapted to be associated with a rotatable shaft and a fixed housing and which is assembled and removed as a unit with respect to the shaft comprising:
- a sleeve having a reduced portion defining a shoulder and adapted to surround and be rotatable with said shaft;
- a rotatable seal ring surrounding said reduced portion of said sleeve and resiliently urged into engagement with said shoulder;
- spring means adapted to engage said shaft and said rotatable seal ring resiliently urging said rotatable seal ring into engagement with said shoulder;
- a stationary seal ring surrounding said sleeve;
- engaging seal faces on said seal rings;
- a bellows means connected at one end to said stationary seal ring;
- said bellows means being so constructed and arranged to exert a resilient force on said stationary seal ring to urge it toward said rotatable seal ring; and
- a ring member adapted to be connected to said housing;
- said bellows means being connected at its other end to said ring member.

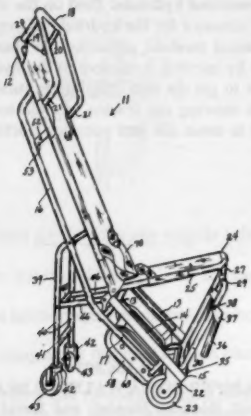
4,136,888
TRANSPORT DEVICE FOR INVALIDS

William R. Bowie, Jr., and George B. Sampson, both of Baltimore, Md., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Oct. 7, 1977, Ser. No. 840,378
Int. Cl.² B62B 5/02
U.S. Cl. 280—5.22 **13 Claims**

1. A transport device for handicapped persons comprising frame means, support means on said frame means structured to receive a person, said frame means being provided with depending front wheel means, movable friction means on the frame means rearwardly adjacent said front wheel means and

located to engage on the edge of a step to receive the weight of said transport device as the front wheel means rolls over said edge in descending the step, and means causing said friction means to move responsive to said weight in a direction to allow downward movement of said frame means over said edge, wherein said frame means includes rearwardly offset side-reinforcing bars at its opposite side edges, said reinforcing bars extending substantially parallel to said opposite side edges and defining a storage space therebetween, upwardly foldable wheeled rear support means pivoted to said frame means and



being receivable at times in said space between said side-reinforcing bars so as to be substantially coplanar with the upper portion of said frame means, and pivoted strut bar means on the rear support means, said strut bar means being provided terminally with spring clamping hook means lockingly engageable with said frame means to at other times lock the wheeled rear support means in a depending downwardly and rearwardly extended operative position relative to the frame means so that the device may be employed as a wheeled chair at said other times.

4,136,889

COLLAPSIBLE TROLLEY

John R. Middleton, London, England, assignor to M.S. Precision Products Limited, London, England

Filed Apr. 4, 1977, Ser. No. 784,448
Int. Cl.² B62B *1/04*
U.S. Cl. 280—30 **3 Claims**

1. A trolley comprising a substantially rectangular support framework including side members parallel to each other which at one end serve as handles;
- a pair of arms parallel to each other and pivotally mounted at one end thereof on said side members on an axis transverse to said side members between the ends thereof;
- ground engaging members mounted on the other ends of said arms;
- a first retaining rod carried by said side members transversely thereto near the ends thereof remote from said handles;
- a second retaining rod carried by said side members transversely thereto adjacent to the axis of said pair of arms;
- a support device pivotally mounted on said arms at the ends thereof remote from the axis of said arms and arranged so as to be movable between said side members;
- first retaining means for holding the free ends of said arms (8) removably on to the first retaining rod;
- second retaining means for holding the free end of the support device removably on the second retaining rod;
- a cross-bar carried by the side members at the ends remote from the handles;

the arrangement being such that the retaining means when engaged hold the said arms and support device parallel to the side members but permit

(a) the support device to be moved pivotally between the side members to rest on said cross-bar in V-formation with the side members and arms to form a trolley.

(b) permit the arms to be swung away from the side members and the support device to be engaged with the first retaining rod; and

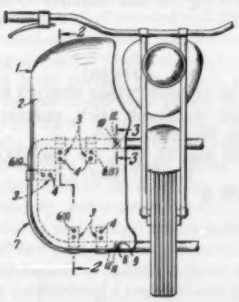
(c) the arms can be swung through 180 degrees and the support device and be engaged with the second retaining rod.

4,136,890

COMBINATION LEG SHIELD AND CRASH BAR FOR MOTORCYCLES

Nicholas E. Vertucci, Farmingdale, N.Y., assignor to William Chillianis, Flushing, N.Y.

Filed Aug. 19, 1977, Ser. No. 826,258
Int. Cl.² B62J *17/00*
U.S. Cl. 280—289 S **2 Claims**



1. In combination with the crash bar of a motorcycle, a pair of essentially identical, but opposite hand leg shields of unitary plastic construction generally symmetrically arranged about a longitudinal center line and secured to the crash bar of the motorcycle, said shield of sufficient height and breadth to protect the legs, feet and thighs of the operator, said leg shield of planar construction at the lower portion for ease of attachment to the crash bar, but curved convexly aft at the top and outer side, such curvature mainly about a horizontal axis, to especially provide a lifting force to the shield which stiffens the shield to a high degree during riding without the need for

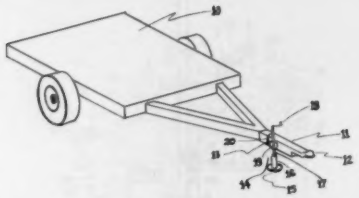
beads, stiffeners, strips, bands or the like while maintaining the flexibility of the shield when the motorcycle is not in motion, allowing for especially lightweight and inexpensive construction.

4,136,891

SELF-RELEASING JACK ASSEMBLY

Thomas G. Menzel, 156 Santa Rita St., Los Banos, Calif. 93635

Filed Aug. 25, 1977, Ser. No. 827,604
Int. Cl.[2] B60D *1/00*
U.S. Cl. 280—475 **5 Claims**



1. In combination, a draft tongue of a towable vehicle and a rotatable support assembly comprising:

a mounting plate having a vertical surface in a plane substantially parallel to the direction of movement of said towable vehicle in normal travel;

an adjustable jack assembly having a ground engaging portion and a lifting head portion;

means for providing rotation about an axis, the plane of rotation being substantially parallel to the aforesaid plane of the mounting plate, said means being comprised of an axle affixed with the axis thereof normal to said mounting plate and a centrally perforated disc rotatably mounted on said axle, said disc having a predetermined thickness and an edge surface along the circumference thereof;

means for affixing said lifting head portion to said means for providing rotation about an axis; and

means for inhibiting the rotation of said means for providing rotation about an axis and the jack assembly affixed thereto until rotational forces reach a predetermined level

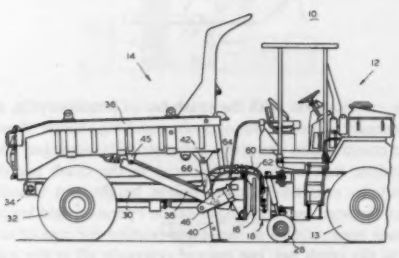
said means being a detent mechanism comprised of at least one notch on the surface of said disc and a means for engaging said notch which automatically leaves the notch when said rotational forces reach said predetermined level thereby allowing the jack assembly to rotate about said axle.

4,136,892

METHOD OF CONNECTING VEHICLE MODULES

Ralph M. Duttarer, St. Joseph, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Aug. 15, 1977, Ser. No. 824,461
Int. Cl.[2] B60D *1/00*
U.S. Cl. 280—479 R **2 Claims**



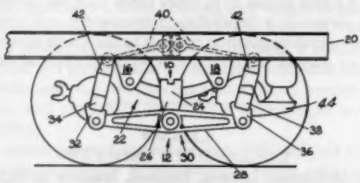
1. The method of connecting together a tractor module and an implement module to form a complete vehicle, wherein the tractor module includes a first coupling portion and a source of pressurized hydraulic fluid, and the implement module includes a frame having a second coupling portion thereon with a hydraulically operated movable structure on the frame portion together with a hydraulic actuator for operating it and legs arranged to be selectively located between the hydraulically operated structure and the ground for supporting the implement module at rest, the method comprising moving the tractor module adjacent the vehicle module so that the two coupling portions are in confronting relation, connecting the source of pressurized hydraulic fluid on the tractor module to the hydraulic actuator for the hydraulically operated structure on the implement module, adjusting the frame of the implement module by moving it relative to the hydraulically operated structure to get the two coupling portions in position for coupling, and moving the tractor module toward the implement module to mesh the two coupling portions together.

4,136,893

MOTION DAMPER FOR A WALKING BEAM ASSEMBLY

Philip J. Sweet; Buck C. Hamlet, and David L. Sweet, all of Fresno, Calif., assignors to American Carrier Equipment, Inc., Fresno, Calif.

Filed May 31, 1977, Ser. No. 801,768
Int. Cl.[2] B60G *5/02*
U.S. Cl. 280—678 **1 Claim**



1. In a suspension system for a tandem axle vehicle characterized by a horizontally oriented frame, a pair of live axles extended transversely of said frame and arranged in mutually spaced parallelism, and a pair of pivotal walking beam assemblies disposed beneath the frame of the vehicle in spaced parallelism, each of said assemblies being characterized by a pivotal walking beam extended in interconnecting relation with the axles of said pair and pivotally coupled in supporting relation with a leaf spring assembly for angular movement about an axis passing through the midportion of the walking beam, as harmonic motion is imparted thereto, means for damping highway-induced harmonic motion imparted to the walking beams, comprising:

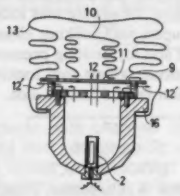
A. a pair of brackets rigidly affixed to the housing of one of said axles and projected perpendicularly therefrom in substantial parallelism with said frame; and

B. a pair of air springs, each including an air bag mounted on a projected portion of one of said brackets and connected to said frame, and means for selectively pressurizing the pair of air springs including a source of air under pressure, and circuit means connected between the air bags and the source of air under pressure for delivering air under pressure to the air springs including a manually operable valve interposed between the source and the pair of air springs.

4,136,894
GAS GENERATOR FOR INFLATABLE VEHICLE SAFETY BAGS

Koichi Ono; Toshiyuki Takahara, both of Tatsuno, and Tetsuyoshi Ito, Hyogo, all of Japan, assignors to Daicel Ltd., Sakai, Japan

Filed Jul. 28, 1977, Ser. No. 819,917
Claims priority, application Japan, Jul. 29, 1976, 51-90569
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—729 **9 Claims**

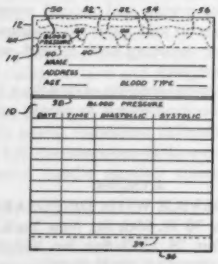


1. A gas generator for an inflatable vehicle safety bag, comprising:
(a) a generator housing defining three independent chambers,
(b) an electrical ignition squib mounted in the bottom of each chamber;
(c) a gas generating agent disposed in each chamber around the squib;
(d) a heat absorbing and filtering material disposed in each chamber overlying the gas generating agent;
(e) an apertured diffuser mounted over the open top of each chamber;
(f) an apertured deflector plate mounted above the diffusers;
(g) an inflatable knee bag sealingly attached to the deflector plate; and
(h) an inflatable torso bag sealingly attached to the generator housing surrounding the knee bag, said knee and torso bags being disposed to receive gases generated in the respective chambers.

4,136,895
INDEXED MANIFOLD SET

Richard E. McKinzie, and Joseph J. Juszak, both of Crystal Lake, Ill., assignors to Uarco Incorporated, Barrington, Ill.

Filed Nov. 14, 1977, Ser. No. 851,183
Int. Cl.[2] B41L *1/20, 1/24*
U.S. Cl. 282—9 R **6 Claims**

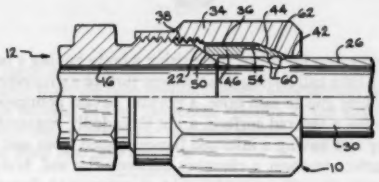


1. A manifold set comprising:
a plurality of superimposed sheets of paper;
means securing said sheets of paper together adjacent a corresponding edge of each sheet;
image transfer means at the interface of adjacent sheets for transferring an image placed on the uppermost sheet to corresponding locations on the lower sheets; and
lines of weakening in each sheet inwardly of said edge and of said securing means, each said line of weakening having a linear part and a bulbous part and extending across said set, the linear parts of each line of weakening being aligned across the set and the bulbous parts of each line of weakening being staggered across the set whereby when said lines are broken, a plurality of individual sheets having individual index tabs are provided with the index tabs being staggered.

4,136,896
FLARELESS TUBE FITTING FOR 37° ADAPTER

Michael R. Rodman, Haviland, Ohio; Paul M. Holmes, and Joseph Habib, both of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.

Filed Nov. 18, 1977, Ser. No. 852,673
Int. Cl.[2] F16L *19/08*
U.S. Cl. 285—341 **2 Claims**



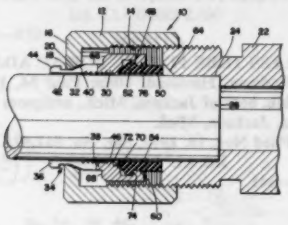
1. A flareless tube coupling for a cylindrical tube comprising, in combination, an adapter having external threads, an external conical nose surface extending outwardly from the end of the adapter and an interior bore concentric with said nose surface, a nut of annular configuration having an internal bore including a threaded region adjacent one end having an outer end and adapted to engage the threads of said adapter, a central ferrule receiving region, and a reduced diameter region adjacent the other end, an annular ferrule within said nut central region, said ferrule including a primary body portion having a substantially cylindrical outer wall and having a minimum inner diameter greater than the outer diameter of the tube and having first and second ends, said ferrule body portion having an annular conical adapter nose engaging surface defined at said first end of an angular orientation complimentary to the angle of said adapter nose surface and an annular axially extending hinge wall of reduced wall thickness projecting from said second end adjacent said ferrule body portion outer wall having an outer cylindrical surface constituting an extension of said body portion outer wall, an annular seal portion defined on said hinge wall axially spaced from said body second end having an inner surface and an outer surface, at least one radially inwardly projecting annular lip defined on said inner surface adapted to sealingly engage the tube, a first conical cam surface defined on said outer surface in radial alignment with said lip, and a second conial cam surface defined upon said nut at said central region axially overlapping and engaging said first cam surface upon threading of said nut upon said adapter threads to radially deform said ferrule seal portion inwardly establishing a seal between said lip and the tube and axially forcing said ferrule body nose engaging surface into a sealing engagement with said adapter nose surface, the axial length of said ferrule being greater than the axial distance between said second cam surface and adapter nose surface which permits the outer end of said nut threaded region to engage said adapter threads whereby said ferrule must be placed in said nut central region with said first and second cam surfaces overlapping and engaging to permit engagement of said adapter threads with said nut threaded region outer end and reversal of said ferrule within said nut central region prevents engagement of said adapter threads with said nut threaded region outer end.

4,136,897

COUPLING DEVICE FOR TUBULAR MEMBERS

David A. Haluch, Plainwell, Mich., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Continuation of Ser. No. 674,956, Apr. 8, 1976. This application Aug. 29, 1977, Ser. No. 828,352
Int. Cl.[2] F16L *11/08*
U.S. Cl. 285—342 5 Claims



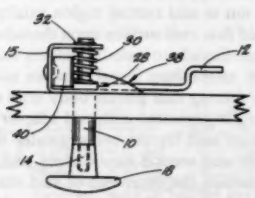
1. A coupling for tubes, comprising a body having a bore to receive a tube and having an abutment surface surrounding the axially outer end of said bore, a portion of said abutment surface having a tapered surface, a nut threadedly engaged with the body and having a inturned flange spaced from said abutment surface to form a chamber between the nut, body and tube, a one piece sleeve within said chamber, said sleeve having an undercut internal recess, an inner end and an outer end, said sleeve also having an axially outer face engageable by the inturned flange for moving the sleeve toward the body when the nut is threaded onto the body, a sealing ring of deformable material having an enlarged diameter portion received within said recess and having a cylindrical extension projecting from the sleeve toward said tapered surface, said recess having a transverse wall at its axially outer end and having a beveled surface intersecting said transverse wall and oppositely inclined to said tapered surface, and said sealing ring having a beveled face oppositely inclined to said tapered surface and adjacent said beveled surface so that upon threading of the nut onto the body the beveled surface will engage the beveled face and the cylindrical extension will engage said tapered surface causing the sealing ring to be deformed into tight sealing engagement with said tube.

4,136,898

COMBINATION DOOR HANDLE AND SAFETY LOCKING DEVICE

Karl H. Guenther, P.O. Box 195, Colden, N.Y. 14033

Filed Nov. 17, 1977, Ser. No. 852,473
Int. Cl.[2] E05C *5/02*
U.S. Cl. 292—57 11 Claims



1. A combination door handle and locking device comprising: '(a) a locking portion comprising a stem adapted to be received in an opening in a door or drawer to be locked and an elongated locking element connected to one end of said stem and projecting outward of said stem;

(b) a handle portion on said stem spaced from said locking element;

(c) a lock housing comprising spaced apart bearing plates having aligned openings therein, said stem being received in said openings of said bearing plates so as to be rotatable and slidable therein, a striking plate and adjacent keeper slot on at least one end of said lockhousing and positioned so that said locking element must override said striking plate in a radial motion as said stem is rotated before entering a locked position in said keeper slot; and

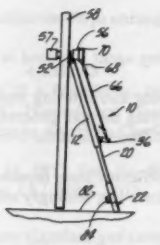
(d) biasing means operatively associated with said stem and said locking element for urging said locking element into said keeper slot upon said locking element passing over said striking plate and for causing pressure in substantially orthogonal directions against said locking element when in a locked position in said keeper slot.

4,136,899

DOOR BRACE

Gary J. Frasher, G-1348 W. Carpenter, Flint, Mich. 48505

Filed Jun. 14, 1978, Ser. No. 915,392
Int. Cl.[2] E05C *17/50*
U.S. Cl. 292—338 10 Claims



1. A device for use in conjunction with a door having a door knob, the rotation of which permits said door to open, said device comprising:

a first elongated member having one end attached to said door,

a second elongated member slidably attached to said first member and movable between an extended position wherein said second member abuts a ground support surface and braces the door against unauthorized entry and a retracted position wherein said second member is free of said ground support surface permitting said door to be opened,

resilient means for urging said second member from said extended position to said retracted position,

locking means for retaining said second member in said extended position, and

means responsive to the rotation of said door knob means for unlocking said locking means to permit said members to move to said retracted position.

4,136,900

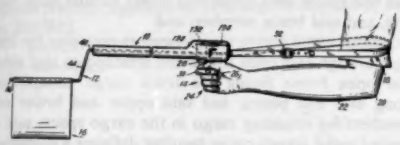
SPREADER DEVICE WITH DISPOSABLE BAGS

Alfred L. Thompson, 70 W. 95th St., New York, N.Y. 10025

Filed Oct. 25, 1977, Ser. No. 845,297
Int. Cl.[2] A01K *29/00*
U.S. Cl. 294—19 R 8 Claims

1. Apparatus comprising a support, receptacle means having open and closed conditions, spreader means supporting the receptacle means on said support and operable to open and close said receptacle means, control means on said support at a position remote from said receptacle means to control said spreader means, said receptacle means being detachable from said spreader means, and forearm engaging means on said support to accommodate a forearm of a user with the corre-

sponding hand of the user on said control means, said control means including a handle and a trigger juxtaposed with respect to each other on said support, said support being an elongated rod, said spreader means including straight parallel arms outside of said support, inclined arms respectively connected to said parallel arms, and further arms connected to said inclined arms and extending into said support, said receptacle means



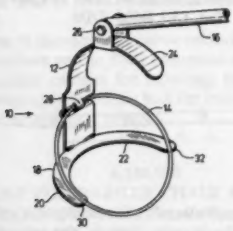
including a receptacle with channels thereon, said straight parallel arms fitting into said channels, coupling means coupling said control means to said further arms to operate the latter, said control means providing a linear force, said further arms operating with a pivotal motion, said coupling means converting the linear force into said pivotal motion about an axis parallel to said support.

4,136,901

GOLF BALL RETRIEVER

Erhard P. Walter, Downsview, Canada, assignor to Howard C. David, Willowdale, Canada, a part interst

Filed Dec. 23, 1977, Ser. No. 863,898
Claims priority, application Canada, Dec. 20, 1977, 293469
Int. Cl.² A63B *47/02*
U.S. Cl. 294—19 A **7 Claims**



1. A golf ball retriever comprising:

(a) a rigid body member having a substantially horizontal base portion, the base portion formed by a pair of arms extending forwardly to define a frontwardly open mouth therebetween;

(b) a retaining member connected at the rear to the body member at a point above the base portion to pivot between a lower retaining position and an upper open position, the retaining member extending forwardly from the body member and having a retaining portion which extends substantially across the mouth of the base portion to support a golf ball therebetween in the retaining position, and

(c) an elongated handle member connected to the body member.

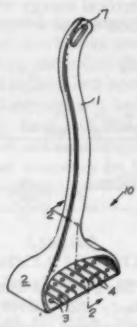
4,136,902

SHOWER SOAP RETRIEVER

Donald L. Leonard, P.O. Box 305, Cornell, Ill. 61319

Filed Oct. 27, 1977, Ser. No. 845,847
Int. Cl.² A47F *13/06*; B25J *1/04*
U.S. Cl. 294—55 **3 Claims**

1. A shower soap retriever comprising a handle having a slot at one extremity and a U-shaped receptor at its other extremity and a length to reach the ground when the user is generally erect, an open face on said U-shaped receptor, a closed face opposite said open face, a substantially planar base portion closing the U-shaped receptor thereby providing a nesting tray and orifices disposed upon said base portion to allow water drainage and linear ribs are disposed on the base portion oriented from the open to closed faces of the U-shaped receptor



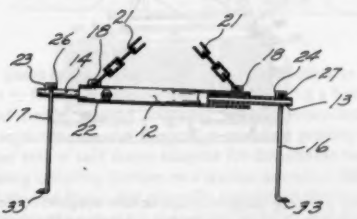
which taper downwardly to said open face to provide removal of the soap from the base portion thereby assuring that the soap will not become soft by tangential relation of the soap to the base, and also whereby the tapering portion will assist in sliding said soap into said receptor.

4,136,903

TIRE LIFTING APPARATUS

Kenneth W. Roethler, Box 6, Larrabee, Iowa 51029

Filed May 16, 1977, Ser. No. 796,939
Int. Cl.² B66C *1/28*
U.S. Cl. 294—81 R **5 Claims**



1. A tire lifting apparatus for use in the lifting of a tire by the inner rim comprising:

a master support sleeve, said sleeve having a hole formed longitudinally therethrough;

first and second movable arms movably secured to said master support sleeve, said first and second movable arms being telescopically disposed in said hole with said arms projecting coaxially from opposite ends of said sleeve; and

first and second hook units secured to said first and second movable arms, respectively, for engaging the inner rim.

4,136,904

UNDERHOOD TOOL AND STORAGE COMPARTMENT

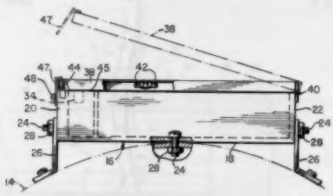
Clifton H. Lauderdale, Rte. #1, Caldwell, Tex. 77836

Filed Jul. 25, 1977, Ser. No. 818,739
Int. Cl.² B60R *5/00, 7/00*
U.S. Cl. 296—37.1 **9 Claims**

1. A tool and storage compartment adapted to be affixed under the hood of vehicles to the internal surface of the fender wheel cover, comprising:

an elongated hollow body having a bottom and front and rear ends provided with fastening means for affixing said body to the internal surface of the vehicle fender wheel cover, said body having a plurality of sections and being

provided with an electrical receptacle, a cover, said cover, hingedly affixed to the rear end of said elongated body, said cover carrying said illumination means thereon, a switch, said switch secured to said body, means to electrically couple said receptacle and said illumination means to a source of electrical energy whereby said receptacle and said illumination means are energized by said source



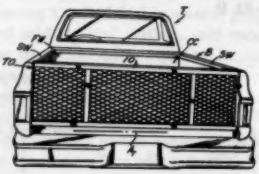
when said cover has a portion thereof hingedly disposed away from said body and whereby said switch and said illumination means and said receptacle are covered by said cover when said portion of said cover is disposed in a closed position adjacent said body, whereby said receptacle is de-energized when said cover is in said closed position.

4,136,905

TAILGATE CONSTRUCTION

Homer R. Morgan, 2765 Townley Cir., Doraville, Ga. 30340

Filed Oct. 20, 1977, Ser. No. 843,804
Int. Cl.[2] B62D *33/02*
U.S. Cl. 296—50 **4 Claims**



1. A low air drag tailgate construction adapted to be pivotally mounted in the tailgate opening between the truck sidewalls at the trailing end of the open top cargo compartment of a pickup truck on the tailgate mounting brackets provided on the pickup truck in replacement of the conventional tailgate normally associated therewith, said tailgate construction comprising:

an open frame having a peripheral configuration corresponding generally to the configuration of the tailgate opening to the open top cargo compartment of the pickup truck, said open frame pivotally connected to the trailing end of the pickup truck in lieu of the conventional tailgate for selectively extending around the tailgate opening at the trailing end of the open top cargo compartment, said open frame comprising a pair of spaced apart, parallel generally vertically extending end plates having upper and lower ends; an upper, generally horizontal, tubular edge member extending between and connected to the upper ends of said end plates; a lower, generally horizontal, tubular edge member extending between and connected to said end plates adjacent the lower ends thereof; at least one generally vertically extending tubular brace member extending between and connected to said upper and lower tubular edge members intermediate their ends; and a pair of pivot connectors attached to the lower ends of said end plates below said lower tubular edge member and coaxially aligned along a common tailgate pivot axis generally parallel to said upper and lower tubular edge members, said pivot connectors adapted to pivotally connect said open frame to the tailgate mounting brackets on the pickup truck so that said open frame can be pivoted upwardly to a closed position whereby said end plates extend along opposite sides of the tailgate opening, said upper tubular edge member extends along the upper edge of the tailgate opening, and said lower tubular edge member extends along the lower edge of the tailgate opening, said open frame defining opening therethrough between said end plates, said upper and lower tubular edge members, and said brace member; and

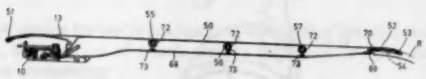
an expanded metal screen cover member covering the openings through said open frame and attached to that side of said open frame facing the truck cargo compartment along said end plates, and said upper and lower edge members for retaining cargo in the cargo space, said expanded metal screen cover member defining a plurality of small air passages therethrough so that the size of any one of said air passages is sufficiently small to retain cargo in the cargo compartment yet at least seventy-five percent of the cover member area is open through said air passages to permit air to flow therethrough to reduce the air drag associated therewith, said expanded metal screen cover member constructed and arranged so that it is strong in a direction normal to the plane of said cover member to prevent bending of said cover member when engaged by cargo in the cargo compartment and to reinforce said open frame.

4,136,906

OPENING ROOF FOR VEHICLES

Alfred L. Ireland, and Raymond B. Osborne, both of Wolverhampton, England, assignors to Edward Rose (Birmingham) Limited, England

Filed Sep. 2, 1976, Ser. No. 719,727
Int. Cl.[2] B60J *7/06*
U.S. Cl. 296—137 C **6 Claims**



1. In an opening roof assembly for fitting to a vehicle having a roof formed with an opening therein, the assembly comprising a support member, an opening and closing means having a part carried by the support member, means for mounting the support member on the vehicle for movement relative to the opening in the roof thereof between a first position in which the opening and closing means closes the opening and a second position in which the roof is open, and operating means connected between the support member and the said part of the opening and closing means and operable by actuating means operatively connected thereto to move the said part of the opening and closing means relative to the support member between a first position in which the said part of the opening and closing means is in clamping engagement with the vehicle roof whereby the support member is locked against movement between its said first and second positions, and a second position in which the said part of the opening and closing means is released from clamping engagement with the vehicle roof thereby to permit such movement of the support member, the improvement wherein the operating means comprises a clamping mechanism including a turnable component mounted on the support member and operable, on turning thereof, to move the said part of the opening and closing means relative to the support member between its said first and second positions, and the actuating means includes a turnable component mounted on the support member at a spacing from the clamping mechanism, and wherein an endless flexible drive element passes around the said two turnable components, the element and the components having co-operating drive formations to

provide a positive drive of the operating means by the actuating means.

4,136,907

BARBERCHAIR

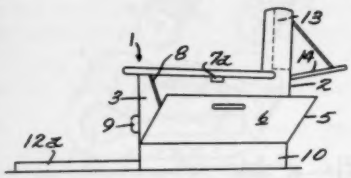
Margret Hermanns, Gotzweg 15, D-4050 Monchengladbach 2, Fed. Rep. of Germany

Filed Feb. 24, 1977, Ser. No. 771,756

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1976, 2607862

Int. Cl.[2] A47D *15/00*; A47C *7/50*; A47B *83/00*

U.S. Cl. 297—182 36 Claims



1. A chair for use when cutting hair, comprising:

a seat member;

a back rest in operative relationship with said seat member for enabling a person seated on said seat member to lean back against said back rest;

means in operative relationship with said seat member and said back rest for supporting said seat member and said back rest and defining a first internal area or cavity;

side wall members positioned adjacent to said seat member and each of said side wall members defining an internal cavity or area in fluid communication with said first cavity; and

plate means in movable operative relationship with said side wall members and in fluid communication with said side wall member cavities for receiving falling hair from the person seated in the chair and for enabling said hair to be directed to said first cavity.

4,136,908

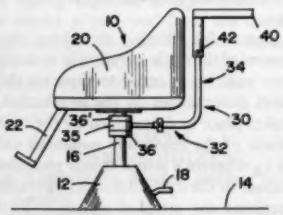
MOUNT FOR BARBER CHAIR ACCESSORY

Robert P. Crayne, 108 Newton Dr., Burlingame, Calif. 94010

Filed Oct. 8, 1976, Ser. No. 730,842

Int. Cl.[2] A47C *7/62*

U.S. Cl. 297—188 10 Claims



1. In a hydraulic chair structure of the type used by barbers and beauticians comprising a pedestal engaging the floor, a piston having one end received in said pedestal for relative vertical hydraulic movement with respect to said pedestal and a chair mounted on the other end of said piston, the improvement comprising:

a. a rigid mounting ring coaxially surrounding said piston with a close tolerance for rotation thereabout, said mounting ring having a lower end surface lying in a plane normal to the axis thereof;

b. a rigid support ring coaxially surrounding said piston and rigidly fixed thereto at said other end thereof beneath said mounting ring and supporting said mounting ring thereon immediately adjacent said chair, said support ring having an upper end surface lying in a plane normal to the axis thereof with said upper end surface of said support ring slidably abutting the lower end surface of said mounting ring;

c. means rigidly fixing said rigid support ring to said piston;

d. an elongated support arm having one end rigidly mounted on said mounting ring and a first portion extending from said one end of said support arm normal to the axis of said mounting ring; said support arm having a second portion extending upwardly from said first portion substantially parallel to the axis of said mounting ring to a free end; and

e. means mounting an accessory on said free end of said support arm.

4,136,909

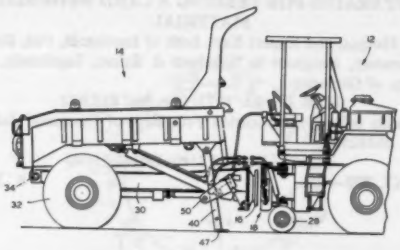
VEHICLE MODULE

Ralph M. Duttarer, St. Joseph, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Aug. 15, 1977, Ser. No. 824,462

Int. Cl.[2] B60P *1/04*

U.S. Cl. 298—17 B 4 Claims



1. A dump body vehicle module for connection to a tractor module to form a complete vehicle, comprising a horizontally disposed frame, ground engaging wheels connected to said frame adjacent one end thereof, a coupling portion adjacent the other end of said frame adapted for detachable connection to a mating coupling portion on a tractor module, a dump body carried by said frame and pivotally connected thereto, double-acting hydraulic actuators connected between said dump body and said frame for moving said dump body pivotally between a carrying position and a raised position, and legs adapted to be positioned between said dump body and the ground for supporting one end of the module when it is not connected to a tractor module, the said hydraulic actuators supporting said frame from said dump body in the last mentioned condition.

4,136,910

EXCAVATING MACHINES

Derek Plummer, Burton upon Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Oct. 10, 1975, Ser. No. 621,374

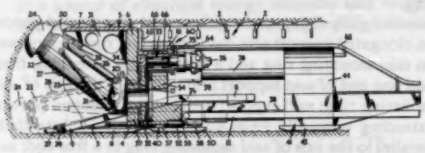
Claims priority, application United Kingdom, Oct. 30, 1974, 46943/74

Int. Cl.[2] E21C *25/06, 29/02*

U.S. Cl. 299—31 16 Claims

1. An excavating machine for forming an underground roadway at least a part of a rock boundary of which is of arcuate form, comprising a cutter unit and a stay unit, each of which is anchorable in the roadway and each of which is releasable and advanceable along the roadway with respect to the other unit, advancing means for advancing in use the currently released unit with respect to the currently anchored unit, a boom support member carried by the cutter unit for rotational movement about an axis longitudinally extending

along the roadway, a forwardly directed, rotary cutter-carrying boom pivotally mounted on the boom support member, ram means for controlling pivotal movement of the boom, a mechanism for moving the boom support member about said



axis, a rotary cutter head mounted on the boom for cutting the arcuate form of the rock boundary, rotary cutter drive means carried by the boom for rotating the rotary cutter and loading means arrangeable in use to collect and convey broken rock cut by the rotary cutter.

4,136,911

APPARATUS FOR FEEDING A CARD WITH FIBER MATERIAL

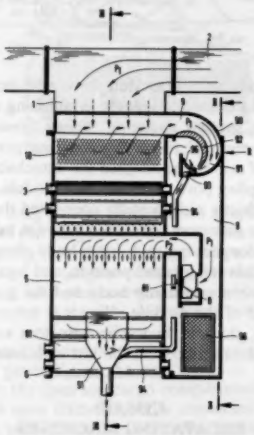
Gerd Husges, and Rupert Karl, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jul. 15, 1977, Ser. No. 815,922

Claims priority, application Fed. Rep. of Germany, Jul. 30, 1976, 2634250

Int. Cl.² B65G *53/40*; D01G *15/40*

U.S. Cl. 302—59 **5 Claims**



1. An apparatus for feeding a carding machine with fiber material, having a filling shaft which is fed via a preceding feed shaft, the fiber material being conveyed into the feed shaft by means of a stream of air flowing through a conveying conduit and said stream of air used for conveying said fibers to said feed shaft enemerging from said feed shaft, said apparatus comprising:

an air circulating passage connecting said feed shaft to said filling shaft,

said stream of air emerging from said feed shaft being conveyed into said filling shaft through said air circulating passage for compressing the fiber material therein, and

an air cleansing device disposed in said air circulating passage for cleaning said stream of air emerging from said feed shaft.

4,136,912

METHOD AND ARRANGEMENT FOR FILTERING DIGITAL, MEASURED CYCLE-DURATION VALUES, IN PARTICULAR IN ANTISKID CONTROL DEVICES ON VEHICLES

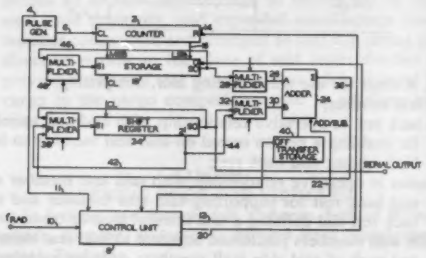
Karl-Heinz Hesse, Gehrden; Gerhard Ruhnau; Wolfgang Gudat, both of Hanover, and Peter Liermann, Gehrden, all of Fed. Rep. of Germany, assignors to WABCO Westinghouse G.m.b.H., Hanover, Fed. Rep. of Germany

Filed Oct. 7, 1977, Ser. No. 840,460

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1976, 2646375

Int. Cl.² B60T *8/00*

U.S. Cl. 303—91 **36 Claims**



1. A method for filtering disturbing signals in the digital measurement of the cycle duration in an antiskid control system for motor vehicles in order to suppress the damaging influence of short disturbances on the production of control signals which takes place as determined by the result obtained from a comparison of the respective measured value τ_n with a reference value τ_B, wherein the filtering is characterized by the steps of; entering a digital measured value τ_n, obtaining a mean value from the reference value τ_B and a new measured value τ_n, and producing a new reference cycle duration τ_B, which is a function of the difference between the reference value τ_B and the mean value.

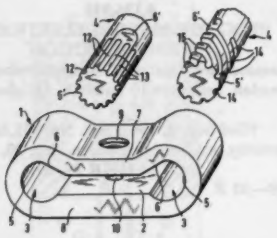
4. An arrangement for filtering disturbing signals in the digital measurement of the cycle duration in an antiskid control system for motor vehicles in order to suppress the damaging influence of short disturbances on the production of control signals which takes place as determined by the result obtained from a comparison of the respective measured value τ_n with reference value τ_B wherein a wheel sensor provides a series of signals proportional to the cycle duration, characterized by, a control unit receiving the series of signals and controlling a measurement device, the measuring device measuring the respective cycle duration (τ_n), a first storage connected to the control unit accepting the respective, digital cycle-duration value measured (τ_n), a second storage containing the corrected measured value (τ_B) obtained from a preceding measurement and representing the respective reference value, a first device forming the mean value from the respective stored values and being connected with the first and second storages, and a second device for ascertaining the difference between the reference value and the mean value, and the sum obtained from the difference and the reference value determining the new reference value.

4,136,913

ROD CONNECTOR FOR AN ENDLESS TRACK

Ludwig Pietzsch, Karlsruhe; Harald Kauer, Ettlingen, and Rudolf Hartmann, Karlsbad-Auerbach, all of Germany, assignors to Dr.-Ing. Ludwig Pietzsch, Ettlingen, Germany

Filed Apr. 5, 1977, Ser. No. 784,714
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1976, 2657905
Int. Cl.² B62D 55/20
U.S. Cl. 305—58 PC 6 Claims



1. Connector means for connecting together the adjacent ends of successive chain links of an endless track, comprising

(a) an end connector member containing transversely extending through openings at its forward and rear ends, respectively, each of said through openings including

(1) a curved first inner wall contact surface which comprises, in transverse cross-section, a segment of a circle, and

(2) a flat second inner wall contact surface, said contact surfaces extending the length of said through opening; and

(b) a pair of cylindrical rod members extending at one end within said openings, respectively, each of said rod members having on its outer periphery

(1) a curved first outer wall contact surface in contiguous frictional engagement with said first inner wall contact surface, and

(2) a flat second outer wall contact surface in contiguous frictional engagement with said second inner wall contact surface, whereby said contact surfaces cooperate to prevent rotation of said rod member relative to said end connector member;

(c) each of the curved and flat contact surfaces of one of said members containing at least one groove, whereby when the corresponding curved and flat contact surfaces are pressed tightly together in tight frictional engagement, foreign matter is removed from the contact surfaces to produce a large constant frictional force between the members for preventing axial displacement of the rod member relative to the connector link.

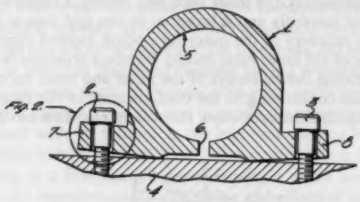
4,136,914

BEARING HOUSING

Sture Östling, Katrineholm, Sweden, assignor to SKF Nova AB, Goteborg, Sweden

Filed May 10, 1977, Ser. No. 795,558
Claims priority, application Sweden, May 21, 1977, 7605766
Int. Cl.² F16C 35/00
U.S. Cl. 308—15 5 Claims

1. A one-piece bearing housing adapted to be mounted on a base member having a first support surface, said housing comprising a first section having an interior peripheral surface defining a bearing seat, a longitudinally extending slot, mounting portions protruding at each side of said first section, each mounting portion being provided with a second support surface, confronting said first support surface, which when not loaded is disposed at a predetermined angle relative to the first support surface, fastening means adapted to press said mounting portions against the base thereby to elastically deform the first section of the bearing housing whereby the width of the



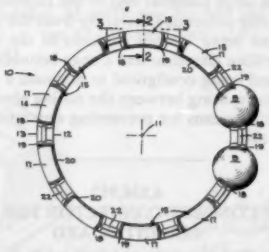
slot may be selectively adjusted and thereby the cross-section dimension of the bearing seat can likewise be adjusted.

4,136,915

BALL BEARING RETAINER

William J. Derner, Indianapolis, Ind., assignor to FMC Corporation, San Jose, Calif.

Filed Apr. 18, 1977, Ser. No. 788,373
Int. Cl.² F16C 33/38
U.S. Cl. 308—201 11 Claims



1. A ball bearing retainer in the form of a unitary molded plastic ring having a central axis, an inner peripheral edge spaced about said axis, an outer peripheral edge spaced about said axis, a base portion extending between said inner and outer peripheral edges of the ring, and a plurality of ball bearing receiving pockets defined in part by fingers on opposite sides thereof and opening axially of the ring in a direction opposite from the base portion, each pocket having a generally truncated spherical concave seat for retaining a ball bearing within the pocket, each pocket having at least one generally cylindrical surface extending radially of the ring from one of the peripheral edges to intersect with the generally truncated spherical concave seat and thereby relieve the truncated spherical portion of the pocket adjacent the peripheral edge from which the cylindrical surface extends to improve the flexibility of the retainer for bending transversely about a line radial of the ring between said fingers and to improve the fatigue life of the retainer by eliminating a spherical wraparound portion of the retainer pocket that would be subjected to extreme stress due to such bending.

4,136,916

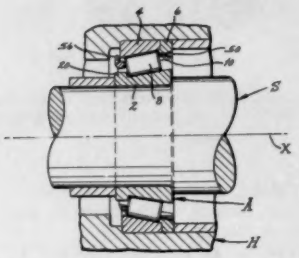
UNITIZED SINGLE ROW TAPERED ROLLER BEARING

Lawrence L. Musselman; William E. Harbottle, both of North Canton, and Joseph P. Berecek, Canton, all of Ohio, assignors to The Timken Company, Canton, Ohio

Continuation of Ser. No. 810,282, Jun. 27, 1977, abandoned.
This application Mar. 20, 1978, Ser. No. 890,589
Int. Cl.² F16C 33/46
U.S. Cl. 308—213 16 Claims

1. A bearing capable of taking radial loading and also thrust loading in both axial directions and comprising: an inner race

having an outwardly presented raceway that is larger at its one end than at its other end and a thrust rib projected outwardly from the raceway at the small diameter end thereof; an outer race surrounding the inner race and having a raceway that is presented inwardly and is larger at its one end than at its other end, the raceway of the outer race being located opposite the raceway of the inner race; rolling elements arranged in a single row between the raceways of the inner and outer races and at their sides conforming to the configuration of the raceways so to seat against the raceways, the rolling elements having large



and small diameter ends with the small diameter ends being located adjacent to the thrust rib on the inner race; a separate rib ring at the large diameter end of the raceway on the outer race, the rib ring projecting inwardly from the raceway of the outer race and being located adjacent to the large diameter ends of the rolling elements; and a cage between the inner and outer races and being configured to maintain a predetermined circumferential spacing between the rolling elements, the cage having retaining means for preventing separation of the outer race and rib ring.

4,136,917

MULTIPLE-CONTACT CONNECTOR FOR A PRINTED CIRCUIT BOARD

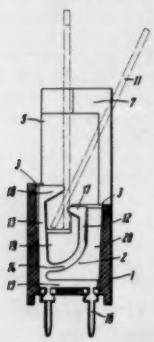
Gebhard Then, Bad Neustadt, and Gerhard Spiller, Saal, both of Fed. Rep. of Germany, assignors to Preh, Elektro-Feinmechanische Werke, Jakob Pre Nachf, Bad Neustadt, Fed Rep. of Germany

Filed May 16, 1977, Ser. No. 797,562

Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2621984

Int. Cl.[2] H01R *13/54*; H05R *1/07*

U.S. Cl. 339—17 L **14 Claims**



1. A multiple-contact connector for a printed circuit board, comprising a housing of insulating material and a plurality of contact springs disposed in the housing for contacting conductor means provided at an edge portion of the circuit board, an opening allowing the circuit board to be inserted at an angle with respect to its final contacting position, detent means for locking the circuit board in its final position upon rotation about an axis parallel to said edge, said detent means being formed so as to produce a net axial force on the circuit board so as to press the circuit board in one direction of said axis into a reference position, and

said detent means including first and second resilient tongues formed at opposite ends of said housing and having different spring characteristics so that upon their deflection they will produce the net axial force toward the referenced position.

4,136,918

PLUG FOR MAKING ELECTRICAL INTERCONNECTION

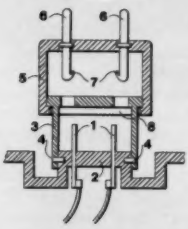
Tore V. Claesson, and Gustav R. A. Gustavsson, both of Sandviken, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed Sep. 8, 1977, Ser. No. 831,387

Claims priority, application Sweden, Sep. 20, 1976, 7610379

Int. Cl.[2] H01R *29/00*

U.S. Cl. 339—31 R **9 Claims**



1. A plug having contact pins for insertion into an electrical outlet comprising a base plate and an element which comprises a yoke and a case movably arranged over said yoke, said plug having two pairs of contact pins of which one pair is fastened to said base plate, in which plug said case and said yoke are pivotingly mounted on pivot means on said base plate for pivotal movement of said case and yoke as a unit about said pivot means, and the second pair of contact pins is fastened to said element, whereby the first pair of contact pins can be connected with the second pair of contact pins by contact means to adapt said second pair of contact pins for insertion into the outlet or alternatively said case and yoke can be jointly moved about said pivot to expose said first pair of contact pins for insertion into said outlet.

4,136,919

ELECTRICAL RECEPTACLE WITH RELEASABLE LOCKING MEANS

Guy W. Howard, #3-1598 Sir Francis Drake Blvd., San Anselmo, Calif. 94960, and Brian W. Dodd, 46 Juniper Rd., San Geronimo, Calif. 94973

Filed Nov. 4, 1977, Ser. No. 848,493

Int. Cl.[2] H01R *13/54*

U.S. Cl. 339—75 P **8 Claims**

1. An electrical receptacle adapted to lock a cap to itself by engaging the holes in the blades, comprising:

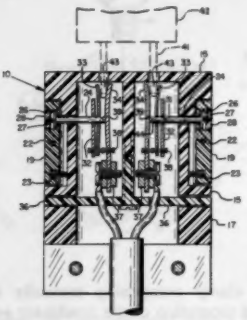
a receptacle body having slots for insertion of the cap blades and conductors inside for engaging against the cap blades;

a pair of locking pins slidably mounted within the receptacle body so as to be aligned with the respective cap blade holes;

a pair of lock pin spring means, one acting on each pin, urging the pin toward the position of engagement with the cap blade holes, said pins having blade-engaging ends which are tapered on the side toward the blade slots of the receptacle so that insertion of the blades cams the pins out of the paths of the blades, against the urging of the lock

pin spring means, whereby insertion of the blades automatically causes the pins to retract and then engage the blade holes;

means for manually retracting the pins when it is desired to remove the cap from the receptacle, comprising a pair of lock release levers pivotally mounted on the receptacle body, one at each pin, each lever having one end connected to the lock pin, with spring means biasing the lever



toward a normal position wherein the pin is in an engaged position, said lock pin spring means bearing against a portion of the lock release lever, said lock pin being slidable within the lock release lever between a normal and a pin-retracted position; and

emergency means for releasing the cap blades from the pins when a predetermined degree of pulling force is applied to the cap.

4,136,920

WIRE CLAMPING ELEMENT

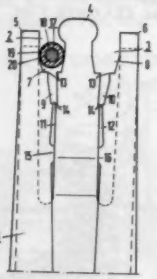
Hans Scholtholt, Lohhof, and Ewald Steiner, Allmannshausen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 27, 1977, Ser. No. 846,175

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1976, 2649098

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—98 **4 Claims**



1. A clamping element for electrically conductively clamping an insulated conductor without stripping the insulation comprising: a clamping member formed of punched sheet conductive material folded back upon itself defining spaced apart double thickness side post members and a single thickness center post member intermediate the side post members, inside edges of at least one of the thicknesses of each of the side post members positioned in opposition to side edges of the center post and defining therebetween conductor receiving slots, each slot being subdivided from an entrance opening into at least two clamping areas of progressively smaller width between the center post edge and the opposed side post edge, each clamping area having an opening thereto defined by insulating piercing contours of the post edges, each slot extending from an open end defined between the center post and a fold bend area of the side posts, the open end open to an insertion insulation opening having a width dimension between the center post and a fold bend area of the side posts, the open end open to an insertion insulation opening having a width dimension between side posts and center post edge walls to receive an insertion carrying conduit and to retain the same therein by engagement with the insulation, the insertion opening having a bottom defined by a first set of insulation cutting edges forming an opening to a first clamping area having a width dimension less than the insertion width dimension and effective to clamp a conductor of a first core diameter in electrically conductive engagement with the conductor core, the first clamping area having a bottom defined by a second set of insulation cutting edges forming an opening to a second clamping area having a width dimension less than the width dimension of the first clamping area and effective to clamp an electrical conductor of a smaller core diameter than the first clamping area in elecrtrically conductive core contact.

4,136,921

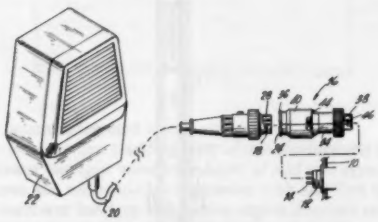
ADAPTER FOR CB RADIO REPLACEMENT

George F. Hardy, 26 Suburban Ave., and Morton E. David, 102 Cliff Ave., both of Pelham, N.Y. 10803

Filed Sep. 12, 1977, Ser. No. 832,166

Int. Cl.[2] H01R *13/46*

U.S. Cl. 339—141 **6 Claims**



1. An adapter for use in connecting a model of a replacement mirophone to a C B radio comprising a shell having at least two complementary parts, a first female connector end for connection to the replacement microphone, a second female connector end spaced and insulated from said first connector end for connection to the C B radio, means for clampingly securing said shell about said connector ends, and wiring means operatively electrically connecting said connector ends to each other.

4,136,922

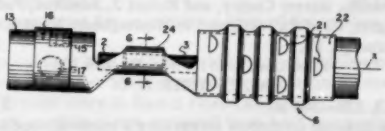
IGNITION CABLE TERMINALS

Stephen J. Grebik, Roseville, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 598,363, Jul. 23, 1975, abandoned. This application Aug. 15, 1977, Ser. No. 824,903

Int. Cl.[2] H01R *11/08*

U.S. Cl. 339—223 S **10 Claims**



1. An ignition cable and terminal assembly comprising a

substantially cylindrical core having conductive material at least on its outer surface and encircled by an insulating jacket, at least one end of said core projecting wholly beyond said jacket; and an elongate, metal conductive member having at one of its ends first means receiving and gripping said jacket and having at its opposite end second means for connection to an electrical terminal, said member having an intermediate portion between its said ends comprising a smooth surface base on which the projecting end of said core lies, said intermediate portion being flanked by a pair of upstanding arms each of which is fixed at one end to said base and has its other end free, each of said arms being rolled to provide between its ends a smooth clamp surface overhanging said base with the free ends of said arms being spaced apart and extending away from one another and being free from engagement with said core and said member, said clamp surfaces and said base forming a triangular clamping zone comprising three circumferentially spaced contact points encircling said core, each of said arms engaging and clamping said core directly against said base, said core resisting a tendency of that part of each of said arms between its clamp surface and its free end to unroll.

4,136,923

UNITARY HOODED ELECTRICAL CONTACT

Tedford H. Spaulding, Norridge, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 14, 1977, Ser. No. 842,185
Int. Cl.[2] H01R *13/12*
U.S. Cl. 339—258 R **16 Claims**

1. An elongated electrical contact formed of a single, integral piece of sheet metal and comprising:

an active contact element forming an open end at one end of the contact including radially resilient tine means for electrically engaging a complimentary pin contact;

an integral terminal element forming an open end at the other end of the contact including means for mechanically and electrically engaging an electrical conductor; and

an open ended hood means coaxially about said active contact element for housing and protecting said active contact element, said hood means including a relatively smooth outer surface free of cutting edges.

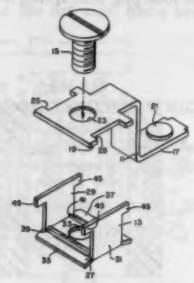
4,136,924

TERMINAL CONNECTOR

Stephen S. Dobrosielski, Beaver; Stephen G. Layciak, Brighton Township, Beaver County, and Robert J. Johnston, Patterson Heights, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 7, 1977, Ser. No. 858,324
Int. Cl.[2] H01R *11/26*
U.S. Cl. 339—263 R **1 Claim**

1. A terminal connector comprising a terminal conductor, a clamp, and a screw; the conductor having aperture means therethrough, the clamp having a U-shaped cross section including a base and legs on each side of the base, the conductor being disposed between the legs, the base having tapped hole means, the tapped hole means being aligned with the aperture means, the screw having a threaded shaft and a head, the threaded shaft engaging the tapped hole means and the head engaging the conductor on the side opposite the clamp, the



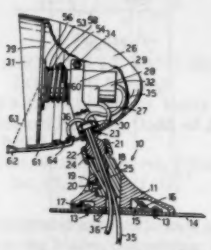
conductor and clamp comprising mutually interengaging means to prevent separation of the conductor and clamp, the interengaging means comprising opening means on the conductor and the legs which are slidably mounted in the opening means, the opening means comprising an edge notch on each opposite edge of the conductor, a leg seated in a corresponding notch, and each leg having a T-shaped end portion.

4,136,925

EXTERIOR-MOUNTED REAR ROTARY VISION MIRROR FOR A VEHICLE

John I. Menzies, and Maureen Menzies, both of Kenmore, Australia, assignors to Menzies Developments Pty. Ltd., Kenmore, Australia

Filed Jul. 13, 1977, Ser. No. 815,311
Claims priority, application Australia, Aug. 20, 1976, 7090
Int. Cl.[2] G02B *5/08*
U.S. Cl. 350—62 **5 Claims**

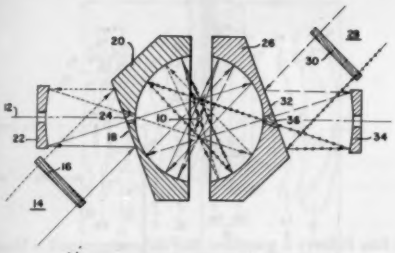


1. An exterior-mounted rear vision mirror assembly for a vehicle having a housing, open at the rear; mounting means connected to the housing and adapted to be mounted on a vehicle; a circular mirror mounted in said housing rotatably about its axis; a motor in said housing; a flexible coupling connecting the drive shaft of said motor to the central part of said mirror, and wherein the improvement comprises a stabilizer which under pressure bears non-centrally on said mirror and is adapted to maintain said mirror substantially in a single desired plane during rotation.

4,136,926
ACHROMATIC ILLUMINATION SYSTEM FOR SMALL TARGETS

Robert D. Sigler, Ann Arbor, Mich., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Apr. 14, 1978, Ser. No. 896,540
Int. Cl.[2] G02B 5/10
U.S. Cl. 350—55 6 Claims

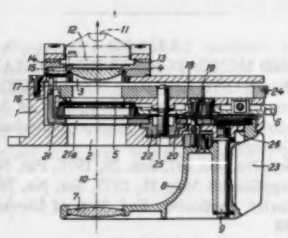


1. An apparatus for focusing light from a beam of parallel rays onto a hemispherical surface comprising:
- a corrector window disposed in the beam to refract the beam;
- a planar mirror disposed to reflect the refracted beam parallel to an axis;
- a paraboloidal mirror disposed to reflect and focus the refracted beam that is reflected from the planar mirror, the paraboloidal mirror coaxial with the axis;
- a pair of cavities having ellipsoidal internal reflecting surfaces, the cavities disposed to place the foci of the ellipsoidal surfaces on the axis, one of the cavities having an aperture on the axis at the focus of the parabola to admit the focused beam from the parabola; and
- a target disposed on the axis midway between the foci of the ellipsoidal internal reflecting surface.

4,136,927
UNIVERSAL MICROSCOPE CONDENSER

Robert Lisfeld, Ulmtal, Ulm, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Jun. 15, 1977, Ser. No. 806,699
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2626864
Int. Cl.[2] G02B 21/08
U.S. Cl. 350—87 16 Claims

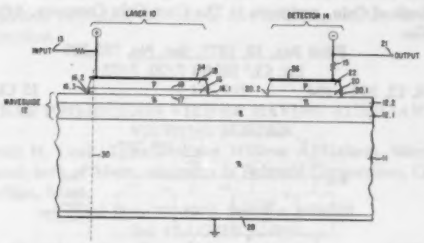


1. A universal microscope condenser comprising:
- a supporting member;
- a fixed lens mounted on the supporting member to provide a fixed optical axis;
- a pivot arm pivoted to said supporting member about an axis parallel to the optical axis;
- a first movable lens member mounted on said pivot arm for movement by said pivot arm into optical alignment with said fixed lens, said first lens member thereby being movable in a plane perpendicular to the optical axis;
- a carrier slide mounted movably on said supporting member for movement in a plane generally aligned with the optical axis;
- a second movable lens member mounted on said carrier slide;
- means acting upon said pivot arm and said carrier slide for moving said first and second lens members into and out of optical alignment with the fixed lens to vary the aperture and luminous field of the microscope condenser; and
- a variable aperture stop disposed between the first and second movable lens members.

4,136,928
OPTICAL INTEGRATED CIRCUIT INCLUDING JUNCTION LASER WITH OBLIQUE MIRROR

Ralph A. Logan, Morristown, and James L. Merz, Madison, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 6, 1977, Ser. No. 794,465
Int. Cl.[2] G02B 5/14; H01S 3/19
U.S. Cl. 350—96.11 11 Claims



4. An optical integrated circuit comprising
- a wide bandgap first cladding layer of one conductivity type,
- a narrower bandgap waveguide layer of said one type contiguous and substantially coextensive with said first layer,
- a still narrower bandgap laser active region disposed on and optically coupled to a localized portion of the free major surface of said waveguide layer,
- means forming an optical resonator which includes said active region along the longitudinal axis thereof, and
- a wide bandgap second cladding layer of the opposite conductivity type disposed on the free major surface of said active region, characterized in that
- said resonator forming means includes at least one surface which is oblique to said axis and which terminates at least one end of said active region, said surface being effective both to provide optical feedback to said active region and to couple laser radiation from said active region into said waveguide layer.

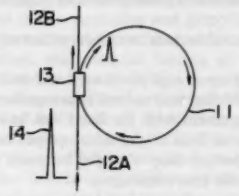
4,136,929
APPARATUS FOR GENERATING LIGHT PULSE TRAIN

Yasuzi Suzaki, Yokohama, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 25, 1975, Ser. No. 635,112
Claims priority, application Japan, Nov. 29, 1974, 49-136186
Int. Cl.[2] G02B 5/14; H01S 3/00
U.S. Cl. 350—96.15 49 Claims

1. An apparatus for generating a train of light pulses comprising:
- an optical fiber loop, said optical fiber loop including at least one optical fiber having respective ends optically coupled with each other to form a closed loop, and
- optical coupling means arranged in at least one portion of said optical fiber loop for introducing a single light pulse into said optical fiber loop, said optical coupling means

further transferring at least a portion of said light pulse from said optical fiber loop each time said light pulse



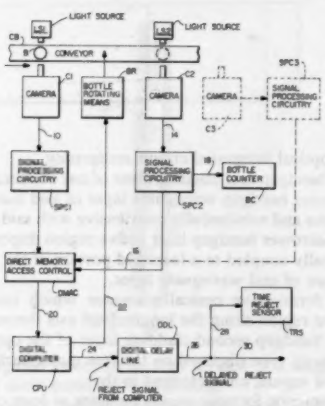
circulates once through said optical fiber loop, such that a train of light pulses being equidistantly spaced in time is generated.

4,136,930

METHOD AND APPARATUS FOR DETECTING FOREIGN PARTICLES IN FULL BEVERAGE CONTAINERS

Thiel Gomm, Castle Rock, and Stephen E. Price, Lakewood, both of Colo., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Jan. 10, 1977, Ser. No. 758,289
Int. Cl.² H04N 7/00, 7/02
U.S. Cl. 358—106 **15 Claims**



5. A system for detecting foreign particles in an optically-transparent liquid-filled container comprising:

a. conveyor means for transporting a plurality of said containers in seriatum through at least first and second inspection stations;

b. first camera means disposed at said first station for detecting a first optical image of each of said containers when the fluid and foreign particles therein are in a substantially static condition;

c. means for storing said first image in a memory;

d. agitation means disposed between said first and second stations for generating motion of said foreign particles in said fluid-filled containers;

e. second camera means disposed at said second station for detecting a second optical image of said container after said foreign particles have been set into motion;

f. means for storing said second optical image in a memory;

g. means for comparing said first and second images stored in said memories; and

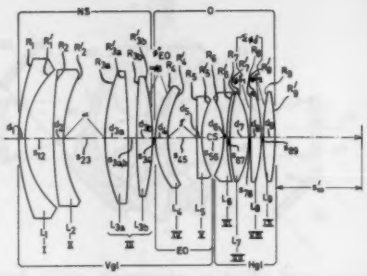
h. means responsive to said means for comparing for generating a reject signal when said first and second optical images differ by a predetermined degree.

4,136,931

HIGH SPEED WIDE ANGLE LENS SYSTEM

Erhard Glatzel, Heidenheim Germany, assignor to Carl Zeiss Stiftung, Oberkochen, Germany

Filed Dec. 2, 1976, Ser. No. 746,655
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1975, 2554963
Int. Cl.² G02B 3/04, 9/64
U.S. Cl. 350—189 **10 Claims**



1. A high speed wide angle lens system consisting of components numbered I through IX consecutively from front to rear, grouped as a front member (Vg1) and a rear member (Hg1) with the first two components I and II collectively forming a negative group followed by a positive component III, components I, II, and III forming a Newtonian finder part (NS), followed with an air lens space by a main lens part (O) the first component of which (IV) is a positive meniscus with its front surface convex toward the front, followed by a negative component (V) and another negative component (VI) air spaced from each other and shaped to provide a strongly dispersing air lens space between them, followed by a plurality of positive components (VII, VIII, and IX(air spaced from each other to provide air lenses δ_1 and δ_2 of collecting power, the component III having a surface power (ϕ_{III}) which is more than the absolute numerical value of the refractive power (ϕ_V) of the negative component V, said component V having a paraxial surface power (ϕ_V) less than the surface power (ϕ_{VI}) of the negative component VI, characterized by the fact that the quotient of the sum of the surface powers of said last mentioned air lens δ_1 and δ_2 ($\phi\delta_1 + \phi\delta_2 = \Sigma\phi\delta$) divided by the refractive power (ϕ_{EO}^{+}) of the air lens between the components III and IV is within the limits of 0.96189 and 1.44233, and further characterized by the fact that the paraxial surface power sum (ϕ_{VIII}) of said component VIII is within the limits of 0.29949 and 0.47886 times the paraxial surface power sum (ϕ_{VII}) of said component VII.

4,136,932

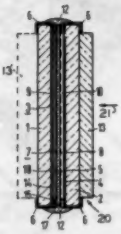
COMPOUND INDICATOR DEVICE CONTAINING AT LEAST ONE LIQUID CRYSTAL CELL

Hans Krueger, and Wolfgang Welsch, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 545,107, Jan. 29, 1975, Pat. No. 4,054,678.
This application May 18, 1977, Ser. No. 798,149
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1974, 2459488
Int. Cl.² G02F 1/13
U.S. Cl. 350—335 **8 Claims**

1. In an indicator device having at least two sealed chambers arranged in tandem directly behind one another in the direction of travel of light in the device, said device including a stack of spaced members sealed together at their margins by glass solder, said stack including a pair of outer glass plate members with at least one transparent, thin carrier member interposed therebetween to form the spaced chambers with adjacent chambers being separated by a carrier member, at

least one of the chambers containing a liquid crystal layer and having transparent conductive material on the surfaces of the members facing the layer to form a liquid crystal cell, the improvements comprising each of said chambers containing a liquid crystal layer, the surfaces of the members facing each chamber having a layer of transparent conducting material with the material on each surface having an interruption in the



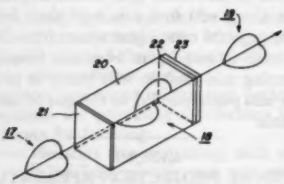
form of a fine continuous line outlining a symbol and electrically separating the symbol from the remaining portion of the material of the layer, each of said symbols and remaining portions having separate electrical leads so that an electrical potential can be selectively applied to each symbol which is different than the potential applied to the remaining symbols and portions to selectively produce at least four separate and distinct symbol indications.

4,136,933

LIQUID CRYSTAL ALIGNMENT FILM BIREFRINGENCE COMPENSATION

James E. Adams; Werner E. L. Haas, both of Webster, and Gary A. Dir, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 2, 1977, Ser. No. 792,615
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—341 **5 Claims**



1. A birefringence compensated member, comprising: a supportive substrate; an alignment film on one side of said supportive substrate vacuum evaporated in a first direction; and, a second alignment film on the other side of said supportive substrate vacuum evaporated in a second direction, said first and second directions being substantially orthogonal to one another.

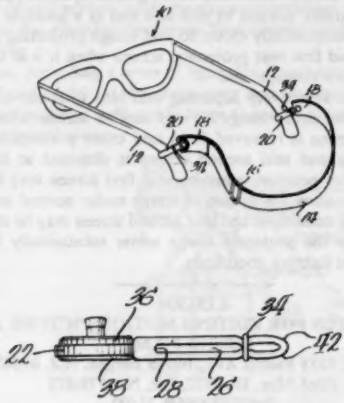
4,136,934

EYEGLASS HOLDER

Suren V. Seron, Joliet, Ill., assignor to Seron Manufacturing Company, Joliet, Ill.

Filed Jul. 14, 1977, Ser. No. 815,538
Int. Cl.[2] G02C *3/00*
U.S. Cl. 351—157 **5 Claims**

5. In an eyeglass holder having an elongated, flexible band terminating in opposed ends each having eyeglass temple-receiving and holding fixtures thereon, the improvement wherein each said fixture comprises a unitary elastomeric molded part having a disc-like portion and an integral, tail-like



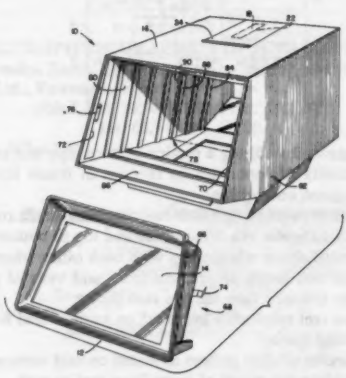
projection extending therefrom, and an elongated slot in said projection.

4,136,935

REAR PROJECTION VIEWER HAVING AUXILIARY VIEWING SCREEN

Gerald H. Cook, Lynnfield, and William A. Holmes, Marblehead, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 30, 1977, Ser. No. 665,788
Int. Cl.[2] G03B *21/10*
U.S. Cl. 352—104 **7 Claims**



1. Photographic apparatus for projection of an image of given size recorded on transparent photographic film for viewing thereof, said apparatus comprising:

a housing defined in part by a first rear projection screen, said first rear projection screen being removably located at an operative position with respect to the other portions of said housing;

image projection means, including a projection lamp and lens, mounted within said housing for projecting the image onto said first screen in a diverging path at least in part along an axis substantially normal to said first screen with the image substantially filling the first screen when located at its said operative position;

a second rear projection screen substantially smaller than said first screen, said second screen and selected sections

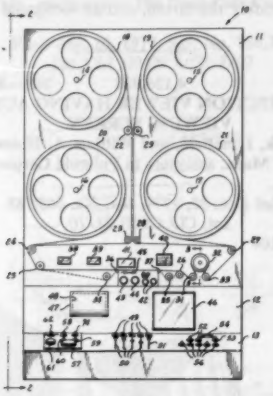
of said other portions of said housing having complementary means formed thereon for selectively locating said second screen within said housing at an operative position substantially normal to said axis and at a location therealong substantially closer to said image projecting means than said first rear projection screen when it is at its said operative position; and

means for selectively adjusting said lens to focus substantially the entire image on said second screen when said first screen is removed from said other portions of said housing and said second screen is disposed at its said operative position, whereby said first screen may be utilized to view the projected image under normal ambient lighting conditions and said second screen may be utilized to view the projected image under substantially higher ambient lighting conditions.

4,136,936
APPARATUS FOR EDITING MOTION PICTURE AND SOUND FILM

Gerald Roe, 8211 Fourth Ave., North Bergen, N.J. 07047

Filed Mar. 18, 1977, Ser. No. 779,073
Int. Cl.[2] G03B *21/00*
U.S. Cl. 352—129 5 Claims



1. Apparatus for editing a motion picture tape and transferring a plurality of sound tracks thereon in frame for frame synchronization comprising:

a. A vertical panel having four reel receiving shafts rotatably mounted therein in a side-by-side and top to bottom parallel spaced about relationship with each other wherein the bottom two shafts project out from said vertical panel a greater distance than the top two shafts;

b. A tape reel rotateably mounted on each of said four reel receiving shafts;

c. A plurality of idler pulleys mounted on said vertical panel for guiding the travel of tapes from reel to reel;

c. A sound picture editing module mounted in said vertical panel through which the motion picture tape to be edited passes;

e. A drive sprocket mounted on said vertical panel over which the tapes travel for driving said tape through said sound picture editing module in a parallel, side-by-side relationship;

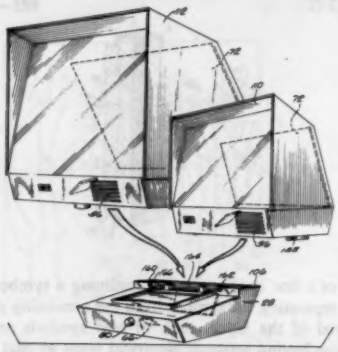
f. An intermediate panel cooperating with and extending below said vertical panel at an angle thereto and having a viewing screen mounted therein for viewing said motion picture tape; and;

g. A base portion cooperating with and extending below said intermediate panel substantially perpendicular to said vertical panel for housing controls necessary for editing said motion picture tape and transferring said plurality of sound tracks thereon.

4,136,937
MICROFILM READER

Lyle A. Fettig, Oconomowoc, Wis., assignor to Data View, Inc., Menomonee Falls, Wis.

Continuation-in-part of Ser. No. 546,154, Jan. 31, 1975, abandoned. This application Oct. 29, 1975, Ser. No. 626,685
Int. Cl.[2] G03B *23/08, 21/28*
U.S. Cl. 353—27 R 13 Claims



1. In projection apparatus having a housing including a housing surface, means defining a surface for supporting upper and lower carrier plates in a projection plane and means for projecting a selected image from an image bearing medium containing a plurality of images, the improvement for retaining and orienting the medium for display of selected images comprising a frame for supporting said plates, connecting means for connecting said frame to said housing to afford guided movement of said plates along first and second transverse axes, and to afford withdrawal of said frame from said housing, said connecting means including a shaft having rotary gear means, linear gear means supported on said housing and having teeth located in mesh with said rotary gear means, releasable means axially locating said shaft with said rotary gear means in alignment with said linear gear means and said rotary gear means being supported on said linear gear means to guide movement of said plates along said first axis, said shaft being movable axially to disengage the rotary gear means from the linear gear means for release of said frame from said housing, and slide means connecting said shaft to said frame to provide guided movement of said plates parallel to the axis of said shaft along said second axis.

4,136,938
OPTICAL PROJECTION APPARATUS

David S. Wise, Solon, Ohio, assignor to McGraw-Hill, Inc., New York, N.Y.

Filed Aug. 16, 1977, Ser. No. 825,172
Int. Cl.[2] G03B *21/28*
U.S. Cl. 353—78 33 Claims

1. An optical projection system comprising:

a lower housing; and

an optical section pivotally connected to said lower housing, said optical section including:

an upper housing having a projector mounted thereon, and a screen for viewing an image generated by said projector;

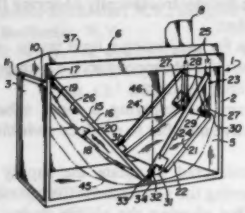
a first mirror pivotally connected to said upper housing and in optical communication with said projector;

a second mirror; and

connecting means for pivotally connecting said second mirror at one end thereof to said upper housing, and for selectively connecting said second mirror at another end thereof to said first mirror such that said first and second mirrors substantially form adjacent legs of a generally triangular structure formed of at least said first and second mirrors, said connecting means adjustably connecting said first and second mirrors together so that the

relative positions of the first and second mirrors are adjustable;

said second mirror being in optical communication with



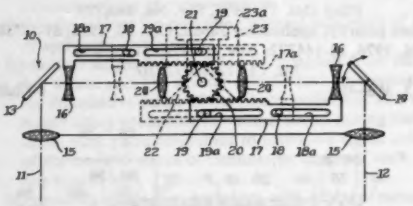
both said first mirror and said screen, whereby an image emanating from said projector is projected on said screen via said two mirros.

4,136,939

RANGEFINDING OPTICAL SYSTEM

Masao Abe, Tokyo, Japan, assignor to Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.), Higashimurayama, Japan

Filed Oct. 3, 1977, Ser. No. 838,610
Claims priority, application Japan, Oct. 8, 1976, 51-121110
Int. Cl.[2] G03B *7/08, 13/10, 13/02*
U.S. Cl. 354—25 **14 Claims**



1. A supplementary optical system for an automatic rangefinder camera with an adjustable main lens comprising:

a pair of optical systems defining two paths from a subject to at least one photosensitive surface;

a pair of mirrors positioned within said paths of the said optical systems for providing a reference image and a scanned image for focusing:

a pair of lens elements disposed along each of said paths between each of said mirrors and said photosensitive surface for optically modifying the image of the subject transmitted to said surface;

a pair of support means operatively connected to each of said pair of lens elements for movement of at least one of said elements axially along each of the respective paths; and

coupling means between said support means and the main lens of the camera for providing controlled relative axial motion of said support means as said main lens is moved to modify the image of the subject transmitted to said surface in accordance with the adjusted position of the main lens.

4,136,940

RESIST DEVELOPMENT CONTROL SYSTEM

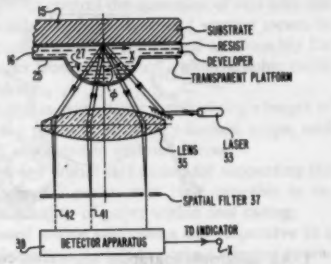
Lawrence H. Lin, Pennington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 862,192
Int. Cl.[2] G03D *13/00*
U.S. Cl. 354—298 **10 Claims**

1. Apparatus, for control of the development process of a resist layer, a surface of which resist layer has been partially altered by an exposure pattern yielding upon development of the resist layer depressed areas alternating, at predetermined periodicity, with relatively non-depressed areas, in a given region of said surface; said apparatus comprising:

means for effecting developer fluid contact with said resist layer;

means, providing a beam of light, for illuminating a portion of said region of the resist layer surface, the illuminated portion being sufficiently large to span a plurality of said depressed areas;



the structure of the emerging depressed areas in the illuminated portion serving as a diffraction grating for diffracting light incident upon said illuminated portion;

means for detecting light power contained in a selected portion of the diffracted light; and

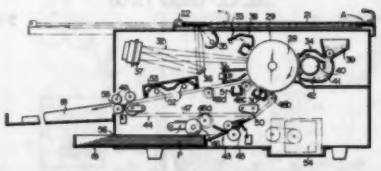
means responsive to the output of said detecting means for indicating achievement of a desired degree of development of said resist layer.

4,136,941

ELECTROPHOTOGRAPHIC COPYING MACHINE

Eiji Sawaoka, Zama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Jan. 14, 1977, Ser. No. 759,553
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 R **7 Claims**



1. An electrophotographic copying machine comprising:

a machine body including first and second sides opposite to each other;

means for forming an image on a copy paper, including a photosensitive rotary drum disposed in the machine body;

an original holder reciprocating on the body to extend over the first side;

copy paper supplying means provided on the first side;

a receptacle for receiving the copied paper, provided on the first side and extending outward therefrom;

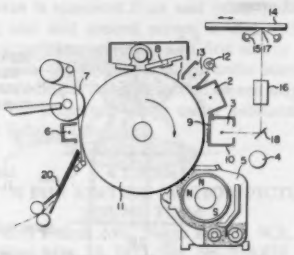
a mechanism for transporting the copy paper from the copy paper supplying means to the receptacle; and

said means for forming an image further including an optical system, said optical system disposed between said first side and said rotary drum and above said mechanism.

4,136,942
ELECTROPHOTOGRAPHIC APPARATUS

Kimio Nakahata, and Yasuyuki Tamura, both of Kawasaki, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1976, Ser. No. 743,499
Claims priority, application Japan, Nov. 25, 1975, 50-141703
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 CH 19 Claims

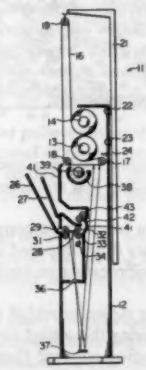


1. An electrophotographic apparatus, comprising:
(a) a three-layer photosensitive medium having an insulating layer, a photoconductive layer, and an electrically conductive substract;
(b) means for applying a substantially uniform primary charge of a predetermined polarity to said photosensitive medium;
(c) means for applying a secondary charge to said photosensitive medium by a corona discharger having a polarity component opposite to that of said primary charge;
(d) means for irradiating said photosensitive member with a light image to be reproduced, said primary charge means, secondary charge means and irradiating means being operable to form an electrostatic latent image on said photosensitive medium; and
(e) means for controlling said secondary charge means to change the discharging power thereof after completion of said electrostatic latent image formation.

4,136,943
VISUAL DISPLAY APPARATUS

Yutaka Koizumi, Tokyo, Japan

Filed Dec. 15, 1976, Ser. No. 750,780
Claims priority, application Japan, Dec. 17, 1975, 50-151032
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—5 5 Claims

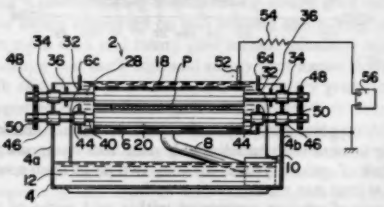


1. A display apparatus for producing an enlarged, erasable display of an original document, said apparatus comprising:
a supply roller and a take-up roller;
a photoconductive member comprising a belt wound at opposite ends thereof around the supply roller and the take-up roller respectively;
first and second idler rollers spaced between the supply and take-up rollers along the length of the belt;
charging means for electrostatically charging the photoconductive member;
projector means for projecting a light image of the original document onto the photoconductive member to form an electrostatic image thereon;
developing means for applying a toner substance to the photoconductive member to produce a visible toner image thereon;
drive means connected to rotate the supply and take-up rollers for moving the phtotconductive member to a viewing position for viewing the visible image, the viewing position being between the first and second idler rollers along the length of the belt, at least one of the first and second idler rollers being movable to vary the distance between the first and second idler rollers; and
erasing means for erasing the visible image from the photoconductive member.

4,136,944
LIQUID TYPE DEVELOPING APPARATUS

Isao Iizaka, Shinshiro, and Osamu Miyamoto, Toyokawa, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Japan

Filed Oct. 17, 1977, Ser. No. 842,799
Claims priority, application Japan, Oct. 18, 1976, 51-125105; Oct. 26, 1976, 51-144372; Nov. 6, 1976, 51-149090
Int. Cl.[2] G03G *15/10*
U.S. Cl. 355—10 6 Claims

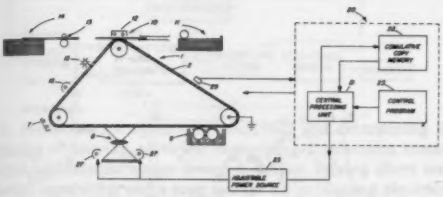


1. A liquid type developing apparatus including walls of electrically conductive material defining a chamber for containing a quantity of developing liquid of toner and organic solution, comprising:
first electrode means made of electrically conductive material and being mounted within said chamber in at least partial contact with the liquid contained therein;
second electrode means made of electrically conductive material and being mounted within said chamber in opposed relationship to said first electrode means for defining therewith a passage for a copy sheet, having an electrostatic latent image on a surface thereof, between said first and second electrode means;
electric power means for impressing a bias voltage on said first and second electrode means;
means mounting said first electrode means in non-contacting relationship with said chamber; and
means connecting said second electrode means in electrically conductive relationship with said chamber;
whereby said first electrode means is electrically insulated from said chamber thereby preventing and leak of the bias voltage impressed between said first electrode means and said chamber.

4,136,945
ELECTROPHOTOGRAPHIC APPARATUS HAVING COMPENSATION FOR CHANGES IN SENSITOMETRIC PROPERTIES OF PHOTOCONDUCTORS

Curtis L. Stephens, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 621,940, Oct. 14, 1975, abandoned.
This application Oct. 28, 1977, Ser. No. 846,666
Int. Cl.[2] G03G *15/16*
U.S. Cl. 355—14 6 Claims



1. In electrophotographic apparatus of the type utilizing a reusable photoconductor and including means for uniformly electrostatically charging the photoconductor and means for exposing the photoconductor to an imagewise pattern of radiation, said charging and exposing means being cyclically operable to form a latent electrostatic image, the improvement comprising:

(a) actuatable means, operatively associated with said exposing means, for adjusting the magnitude of imagewise exposure of the photoconductor;

(b) sensing means for providing a signal indicative of a cycle of apparatus operation;

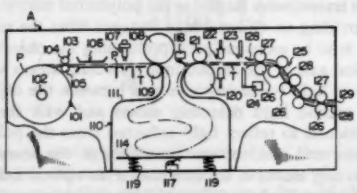
(c) storage means for receiving such signals from said sensing means and for storing information representative of the cumulative usage of the photoconductor, said storage means being actuatable at various stages during the useful life of such photoconductor to provide a signal indicative of the current status of cumulative usage of such photoconductor; and

(d) control means for actuating said storage means, and responsive to the cumulative usage signal therefrom, for actuating said exposure adjusting means in accordance with a control program based on the differing sensitometric characteristics of the photoconductor at each of a plurality of stages during its useful lifespan.

4,136,946
PHOTOGRAPHIC PRINTER AND ASSOCIATED PROCESSOR

Kanichi Nishimoto, Wakayama, Japan, assignor to Noritsu Koki Co., Ltd., Wakayama, Japan

Filed Dec. 15, 1977, Ser. No. 860,890
Claims priority, application Japan, Dec. 28, 1976, 51-175300[U]
Int. Cl.[2] G03B *29/00*
U.S. Cl. 355—28 7 Claims



1. In combination with a photographic printer having a charging member for receiving a length of photographic paper, a pay-out assembly for intermittently paying-out a specified length of the photographic paper, a printing means for controllably exposing the photographic paper after movement of the paper by the pay-out assembly has stopped, a punching member operatively controlled by operation of the printing means to punch a hole at a predetermined location on the photographic paper, roller means for passing the photographic paper through the printer, removal means, including a take-out roller, for transporting said specific length of paper in response to the time required for a treatment of said photographic paper exteriorly of the printer, sensing means for sensing a hole punched in said paper to control the operation of said take-out roller, a cutting assembly responsive to said sensing means to cut a length of said photographic paper, and an assembly for removing the cut paper from the printer, a photographic paper accumulator comprising:

a casing disposed within said printer for receiving a length of the photographic paper in randomly-formed loops, said loops not being subjected to external forces;

a biased plate disposed within said casing for supporting the loops of photographic paper, said plate movable in responsive to the quantity of paper within said casing;

a first switch located within said casing and responsive to a first position of said biased plate to control selected operations of said printer; and

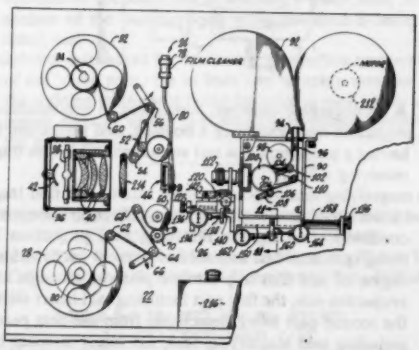
a second switch located within said casing and responsive to a position of said paper within said casing to control a second set of selected operations of said printer,

said paper accumulator storing a length of photographic paper within said printer without subjecting said paper to stress or strain, and said first and second switches responsive to the position of said biased plate and the length of paper within the accumulator to control printer operation in response to the time required by another processing procedure performed on said photographic paper exteriorly of the printer.

4,136,947
MICROFILM PROJECTION PRINTER

James F. Harper; James F. Harper, Jr., and Christian P. Harper, all of 13063 Ventura Blvd., Studio City, Calif. 91604

Filed May 19, 1977, Ser. No. 798,359
Int. Cl.[2] G03B *27/48, 27/52*
U.S. Cl. 355—50 3 Claims



1. A microfilm projection printer for reduction printing which includes:

a projector having means for storing a first film;

means for projecting light through said first film along an optical axis;

a first driving means in said projector for moving said first film continuously at a substantially constant predetermined rate uniform throughout the path of movement of said first film, said first driving means including a driving roller immediately adjacent said optical axis and around

which said first film travels after said first film's passage across said optical axis and a hold back roller immediately adjacent optical axis and around which said first film travels before said films passage across said optical axis whereby said first film is subjected to a substantially constant tension and moves at a substantially constant speed in its passage across said optical axis;

a camera having means for storing a second film;

lens means for forming an image of said first film on said second film;

a second driving means in said camera for moving said second film continuously at a substantially constant predetermined rate uniform throughout the path of movement of said second film;

and motor means including an electric motor connected by a first belt to said first driving means and by a second belt to said second driving means.

4,136,948

PHOTOGRAPHIC ENLARGER

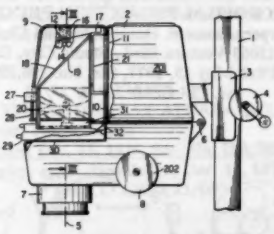
Claus Prochnow, Braunschweig, Germany, assignor to Rollei-Werke Franke & Heidecke, Braunschweig, Germany

Filed Aug. 22, 1977, Ser. No. 826,403

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1976, 7628238[U]

Int. Cl.[2] G03B 27/76

U.S. Cl. 355—71 **7 Claims**



1. A photographic enlarger, comprising in combination:

a projection head including a housing, said projection head having a projection axis and an exchangeable film trap for receiving a film,

a magnifying lens disposed on one side of said film trap,

an insert member including a light-deflection mirror and a condensor abutting the film trap, said projection head being split into first and second parts at least within the region of said film trap along a plane at an angle to the projection axis, the first part including said insert member, the second part being detachable from the first part and including said magnifying lens, sad insert member being guidable within said first part in opposite predetermined directions,

resiliently yieldable means disposed in said first part for exerting a force on said insert member in one of said predetermined directions so as to press said insert member and said condensor against said film trap, and

manually releasable locking means disposed in said projection head for locking said insert member in a predetermined position against the force of said resiliently yieldable means.

4,136,949

METHOD FOR OPTICALLY MEASURING A DISTANCE

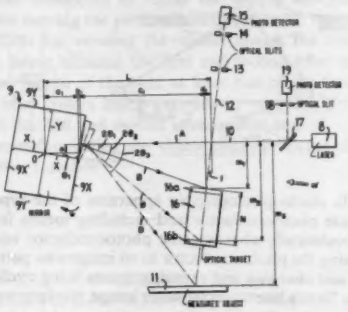
Mamoru Hayamizu, and Yasushi Tanigaki, both of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 27, 1976, Ser. No. 754,524

Claims priority, application Japan, Dec. 26, 1975, 50-157580; Jan. 19, 1976, 51-4743

Int. Cl.[2] G01C 3/00, 3/08

U.S. Cl. 356—1 **5 Claims**



1. A method of optically measuring the distance of an object from a reference line, comprising:

(a) providing a polyhedral mirror and rotating the polyhedral mirror at a constant speed for rotation about an axis selected so that respective distances of faces of the mirror from the axis of rotation are different;

(b) illuminating the polyhedral mirror with a beam of light stationary relative to the polyhedral mirror, wherein the beam of light defines a reference line for measuring a distance of an object relative thereto;

(c) providing first detecting means for detecting light reflected from the polyhedral mirror when the polyhedral mirror is oriented so that the reflected light is reflected along the path of the incident beam of light, and detecting the reflected light with the first light detecting means;

(d) providing second light detecting means having an optical axis for detecting light incident thereon in the direction of its optical axis;

(e) providing a pair of light transmissive targets positioned along the optical axis of the second light detecting means and positioned for reflecting light reflected from the polyhedral mirror and incident on the light transmissive targets to the second light detecting means in the direction of its optical axis;

(f) detecting light successively reflected from the pair of light transmissive targets as the polyhedral mirror rotates;

(g) providing an object whose distance from the reference line is to be measured, and positioning the object on the optical axis of the second light detecting means with the pair of light transmissive targets between the object and the second light detecting means and with the object positioned to reflect light reflected from the polyhedral mirror and incident on the object to the second light detecting means in the direction of its optical axis;

(h) detecting the light reflected from the object as the polyhedral mirror rotates; and

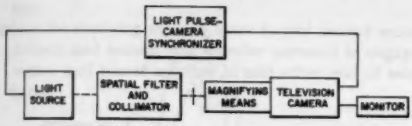
(i) calculating the distance of the object from the reference axis from the times that reflected light is detected by the first and second light detecting means and the speed of rotation of the mirror.

4,136,950

MICROSCOPE SYSTEM FOR OBSERVING MOVING PARTICLES

Joseph H. Labrum, West Jordan, and Donald R. Stewart, Murray, both of Utah, assignors to Labrum Engineering, Inc., West Jordan, Utah

Filed Nov. 8, 1976, Ser. No. 739,426
Int. Cl.[2] G01P *3/36;* H04N *7/18*
U.S. Cl. 356—28 17 Claims



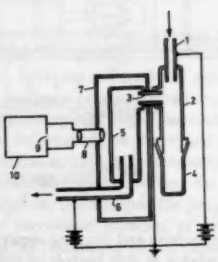
1. A microscope system for observing and determining the velocity of moving particles, comprising a television camera which includes an image sensitive device, having short term storage capability, and a scan system for producing electrical, image-information signals representative of the image sensed by said device, the scan system being adapted to successively scan said device, with blank periods interposed between successive scans, no such signals being produced during the blank periods, and the storage capability of said image-sensitive device being such that an image is stored until said device is scanned and the image is converted to electrical, image-information signals; a light source adapted to produce a series of light pulse pairs, the second pulse of each pair occurring a present time interval after the first pulse of that pair, and each pulse pair having a duration less than the duration of a blank period of the camera; means for synchronizing the light source and the camera, so that any light pulse pairs occur during a blank period of the camera; magnifying means for focusing the camera on an object plane between the light source and the camera, so that the camera sees a magnified image of anything placed in the object plane; and means for monitoring the camera picture to obtain desired information.

4,136,951

SEPARATION AND ANALYSIS OF PARTICLE COATINGS

Dennis J. C. Macourt, 21 Koonawarra Ave., Lindfield, Sydney, N.S.W., Australia

Filed Nov. 5, 1976, Ser. No. 739,110
Claims priority, application Australia, Nov. 28, 1975, PC4104
Int. Cl.[2] G01N *1/00;* G01J *3/00*
U.S. Cl. 356—36 18 Claims



1. A method of determining the nature of a chemical coating on particles, said method comprising the steps of:

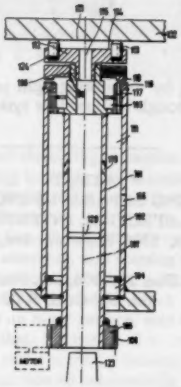
1. Entrapping the coated particles in a flow of chemically inert carrier gas,
2. Plasmatising said carrier gas to volatilize and ionise said coating,
3. Separating the particles from the volatilized and ionised coating constituents, and
4. Analysing said volatilized and ionized coating constituents.

4,136,952

MEASURING THE SURFACE TEMPERATURE OF A BODY

Bernard Mairy, Andene, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie, Brussels, Belgium

Filed Apr. 14, 1977, Ser. No. 787,487
Claims priority, application Belgium, Apr. 14, 1976, 840761; Nov. 17, 1976, 848455
Int. Cl.[2] G01N *1/34;* G01J *5/60*
U.S. Cl. 356—36 14 Claims



1. Apparatus for measuring the temperature of a surface of a body moving past the apparatus, comprising:

a tubular frame;
a shaft mounted for rotation about an axis in the tubular frame;
a motor connected to one end of the shaft and adapted to rotate the shaft in the tubular frame;
a support provided on the other end of the shaft;
at least one scraping member mounted on the support, the at least one scraping member being spaced from the axis of rotation of the shaft and contacting a given zone of the surface of the moving body while the shaft is being rotated; and
a sighting instrument for measuring the surface temperature of the given zone, the at least one scraping member and the sighting instrument being disposed in such a way as to permit sighting of the already scraped middle portion of the given zone.

4,136,953

NEPHELOMETER WITH DETECTION SYSTEM FOCUSED ON OPTICAL DARK REGION

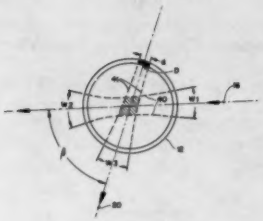
Gerald L. Klein, Orange, and Richard C. Meyer, La Habra, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Jul. 19, 1977, Ser. No. 816,981
Int. Cl.[2] G01N *21/00, 1/10*
U.S. Cl. 356—339 9 Claims

1. A nephelometer comprising:

a source of light;
a container including in a wall thereof a first window area for passing light from the source in a forward direction into the container to impinge upon a substance therein and to scatter therefrom, and a second window area for passing from the container a portion of the light scattering in a forward direction from the substance;
a first lens system having an optical axis passing through the

second window area and an area in the container where light from the source impinges upon and scatters in a forward direction from the sample, and focused on an optical dark region on an inner wall of the container opposite the second window area; and



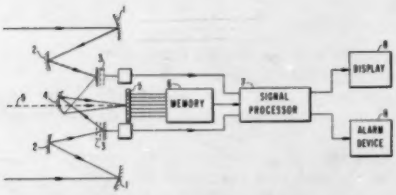
a light detector for monitoring light passing from the container and through the first lens system along the optical axis.

4,136,954

IMAGING APPARATUS INCLUDING SPATIAL-SPECTRAL INTERFEROMETER

John A. Jamieson, 5306 Kenwood Ave., Chevy Chase, Md. 20015

Filed Dec. 29, 1976, Ser. No. 755,288
Int. Cl.[2] G01B *9/02*
U.S. Cl. 356—349 **32 Claims**



1. A split aperture radiation sensor having an entrance aperture of area A comprising at least two apertures separated by a distance B,

a detector array comprising plural transducers arranged to receive focused radiation from said entrance aperture,

relay means located between said entrance aperture and said detector array for redirecting and focusing radiation received within said entrance area A onto said detector array,

wherein the improvement comprises,

phase adjusting means included in said relay means for adjusting the phasing of radiation traversing said relay means from said split aperture as a function of time to produce a time varying diffraction pattern at said detector array, said time varying diffraction pattern having frequency components related to spatial frequencies of radiation incident on said split aperture.

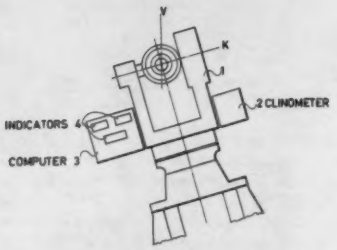
4,136,955

APPARATUS FOR CORRECTING THEODOLITES

Heinz Aeschlimann; Rene Nunlist, both of Aarau, and Rudolf Stocker, Uster, all of Switzerland, assignors to Kern & Co. AG, Aarau, Switzerland

Filed Aug. 27, 1976, Ser. No. 718,375
Claims priority, application Switzerland, Sep. 2, 1975, 11348/75
Int. Cl.[2] G01B *11/26;* G01C *1/00;* G01D *5/34*
U.S. Cl. 356—152 **9 Claims**

1. Apparatus for providing a relative measure of horizontal and vertical angles between first and second directions, comprising means to aim in said first and second directions, means to generate a periodic moire pattern with a relative position corresponding to the direction of said aiming means, four photoelectric receivers in line for sensing the relative position of said moire pattern, each of said receivers covering one fourth of one moire period and providing one signal of two pairs of electrical output signals in push-pull relationship, two differential amplifier means each connected to one of said push-pull output pairs, the differential output signals being in



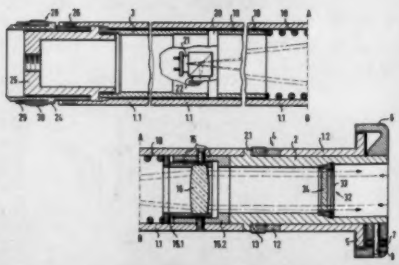
phase quadrature, a clock oscillator means having two output signals of corresponding phase quadrature, signal multiplier means, multiplying each differential output signal with one of the clock signals, forming two product signals, signal adding means, forming the sum of the two product signals and a phase meter for determining the phase difference between the output of said signal adding means and one of the clock signals, said phase difference being indicative of the relative position of said periodic moire pattern and of the direction of said aiming means.

4,136,956

INTEGRATED ATTACHING AND ALIGNING APPARATUS FOR LASER DEVICES IN GUN BARRELS

Kurt Eichweber, Schutzenstrasse 77-85, 2000 Hamburg 50, Germany

Filed Mar. 21, 1977, Ser. No. 779,953
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1976, 2613821
Int. Cl.[2] F41G *3/26;* F41F *27/00*
U.S. Cl. 356—153 **11 Claims**



1. An integrated attaching and aligning apparatus for mounting a laser shot simulator in gun barrels of different calibers, comprising:

a hollow, cylindrical barrel member for being received within said gun barrel, said barrel member being formed in first and second coaxial sections;

means mounted within said barrel member for producing a laser beam simulating a shot from the gun barrel;

a first annular resilient ring being removably disposed about said one section of said barrel member adjacent one end thereof for engaging the interior of said gun barrel and

centering said barrel member in said one end of said gun barrel;

a barrel ring;

a positioning ring removably attached coaxially to said barrel member at one end thereof for mounting said first resilient ring member.

a second annular resilient ring member disposed on the exterior surface of said barrel ring between said sections for engaging a gun barrel interior surface of a given caliber;

means for applying an axial force to said second section to deform said second ring member outward to engage and center said barrel member in said other end of said gun barrel.

4,136,957

RECOGNITION DEVICE FOR RECOGNIZING THE SHAPE AND THE POSITION OF AN OBJECT

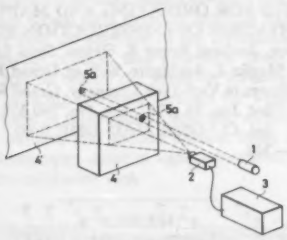
Takeshi Uno, Sayama; Sadahiro Ikeda, Tokyo; Toshikazu Yasue, Hachioji, and Masakazu Ejiri, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 24, 1977, Ser. No. 762,126

Claims priority, application Japan, Jan. 23, 1976, 51-5988; Jan. 26, 1976, 51-6670

Int. Cl.² G01B *11/30*

U.S. Cl. 356—394 **10 Claims**



1. A recognition device for recognizing the shape and the position of an object comprising:

first means for applying a bundle of substantially parallel light beams having a predetermined cross-sectional shape to a space containing said object; second means for receiving the light information in the visual field including at least the portion to which said bundle of parallel light beams is applied and for converting the light information into image signals; third means for progressively picking up selective successive portions of said image signals; fourth means for comparing partial patterns of the respective portions picked up by said third means with at least one reference pattern corresponding to the shape of the cross section of the bundle of light beams and for producing a signal representative of the conformity of the partial pattern and the reference pattern; and fifth means for detecting the position of the picked-up portion in the visual field when the coincidence is detected by said fourth means, thereby recognizing the shape and the position represented by the information detected by said fifth means.

4,136,958

ENCAPSULATED MEASURING APPARATUS

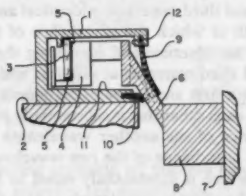
Gunther Nelle, Siegsdorf, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed May 16, 1977, Ser. No. 797,454

Claims priority, application Fed. Rep. of Germany, May 26, 1976, 2623526

Int. Cl.² G01D *11/24*

U.S. Cl. 356—395 **11 Claims**



1. In an encapsulated measuring apparatus including a measuring scale, a scanning assembly for scanning the scale, and means for connecting the scanning assembly to a mounting, the improvement comprising:

a housing member for substantially surrounding the scale and the scanning assembly, said housing member defining an elongated aperture extending substantially along a longitudinal direction through which the connecting means passes and an inner surface, said housing member configured such that, for both a first orientation of the housing member and a second orientation, rotated about the logitudinal direction by substantially 90° with respect to the first orientation, the aperture is positioned to permit a fluid contained in the housing member to substantially completely drain out of the housing member through the aperture; and

means for sealing the aperture around the connecting means, said sealing means including a sealing surface adjacent the connecting means, said sealing means configured such that at least a portion of the sealing surface is positioned substantially no higher than the inner surface in both the first and second orientations in order to permit the drainage of fluid contained in the housing member out of the housing member between the sealing means and the coupling means.

4,136,959

METHOD FOR ANALYZING ONE INGREDIENT OF A THREE INGREDIENT MIXTURE

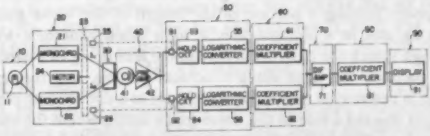
Tadashi Honkawa, and Ritsuo Komori, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1977, Ser. No. 763,674

Claims priority, application Japan, Jan. 28, 1976, 51/7471

Int. Cl.² G01J *3/48, 3/46;* G01N *21/06*

U.S. Cl. 356—418 **1 Claim**



1. A method for quantitatively analyzing one ingredient in a mixture of three ingredients comprising the steps of: passing light rays of a first wavelength and a second wavelength through the mixture of the three ingredients, with the first and second wavelengths being selected at which the absorption spectra of at least two of the materials of the mixture intersect;

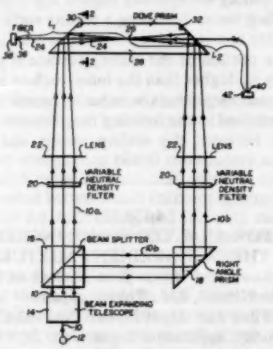
detecting the light waves of the first wavelength transmitted through said mixture and the light rays of the second wavelength transmitted through said mixture and producing first and second electric signals proportional to the transmittance of the first and second wavelengths through the mixture; electrically logrithmically converting the first and second electric signals respectively into third and fourth electrical signals correlated to the absorbance of the light rays of the first wavelength and the light rays of the second wavelength in the mixture; determining one wavelength at which the absorbance of the second and third materials is identical and another separate wavelength at which the absorbance of the second and third materials are identical and measuring the absorbance of the second and third materials at said one and another wavelengths to obtain first and second coefficients having a ratio with respect to each other that is substantially equal to the ratio of the absorbance of the another wavelength in said second material to the absorbance of the one wavelength in said second material, which is substantially equal to the ratio of the absorbance of the another wavelength in said third material to the absorbance of said one wavelength in said third material; and multiplying said third and fourth electric signals by said first and second coefficients, respectively, to obtain fifth and sixth electric signals; differentially amplifying said fifth and sixth electric signals to obtain a seventh differential signal that is quantitatively correlated to only said first material in the mixture.

4,136,960

TEST APPARATUS FOR OPTICAL WAVEGUIDES

Yung-Yien Huang, Freehold; Jerzy A. Olszewski, Edison, and Arnab Sarkar, Piscataway, all of N.J., assignors to General Cable Corporation, Greenwich, Conn.

Filed Feb. 4, 1977, Ser. No. 765,658
Int. Cl.[2] G01N *21/32*
U.S. Cl. 356—239 **16 Claims**



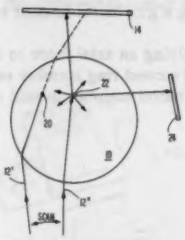
1. Apparatus for determining attenuation and the presence of faults in an optical fiber wave guide, including in combination a support holding a portion of the length of the wave guide with its axis in a straight line, a light beam source, a lens through which the light beam passes, the lens being of a nature that focusses the light along a conical pattern, and the lens being in position to direct the light beam as a converging cone of light toward a side of the wave guide intermediate the ends thereof, a reflector that directs the converging light beam with its axis substantially coincident with the axis of the wave guide, the lens having a substantial focal length so that the light of the beam strikes the sides of the wave guide at a small angle to the axis of the wave guide, so that some of the light of the beam is launched into the wave guide through the sides thereof where the wave guide is held with its axis in a straight line, and a light detector at one end of the wave guide.

4,136,961

METHOD AND APPARATUS FOR DETECTION OF INCLUSIONS IN GLASS ARTICLE OR THE LIKE

Roy V. Young, II, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 1, 1977, Ser. No. 812,340
Int. Cl.[2] G01N *21/32*
U.S. Cl. 356—239 **13 Claims**



1. An inspection system for detecting inclusions in a generally cylindrical member, comprising:

a source for producing a beam of electromagnetic radiation of a wavelength to which the member is substantially transparent;

mounting means for rotatably disposing the member in the path of said beam, the longitudinal axis of the member being displaced from said beam to cause said beam to traverse a chord of the cylindrical member;

sensor means disposed in proximate relation to said mounting means for receiving at least a portion of said beam exiting from the member; and

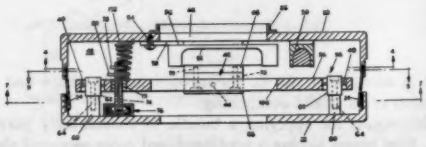
signal processing means responsive to the sequential interruption of said beam for determining the position of an inclusion in the member.

4,136,962

APPARATUS FOR ORIENTING AND MAINTAINING THE ORIENTATION OF CONSTRUCTION EQUIPMENT

Floyd Brouwer, Jenison; Roger E. Helms, Sand Lake; Fred D. Litty, and Merlin J. Applegate, both of Grand Rapids, all of Mich., assignors to Vari-Tech Company, Grand Rapids, Mich.

Filed Jan. 18, 1977, Ser. No. 760,378
Int. Cl.[2] G02B *27/00*; G01C *9/00*
U.S. Cl. 356—248 **15 Claims**



1. An apparatus for orienting and maintaining laser equipment and the like in a predetermined relationship with respect to the horizontal, the apparatus comprising:

a first support means to which a laser or other construction tool can be mounted;

a second support means adapted to be mounted in a fixed position;

third support means gimbaled in position between the first and second support means;

means mounting the third support means to the first and second support means for rotation about first and second axes respectively;

means mounted on the first support means for detecting the angular position of the first support means with respect to a horizontal plane and for generating an output signal representative of the direction and magnitude of angular deviation of the first support means with respect to the horizontal;

servo means electrically coupled to the detecting means and mounted on the third support means for driving the first support means about the first and second axes with respect to the second support means and responsive to the output signal from the detecting means so as to null the output signal from the detecting means; and

said servo means having means to continuously drive said first support means about said axes when the magnitude of said output signal is above a first predetermined value and to intermittently drive said first support means about said axes when the magnitude of the output signal is between zero and the first predetermined value.

4,136,963

COLLIMATOR GUNSIGHT

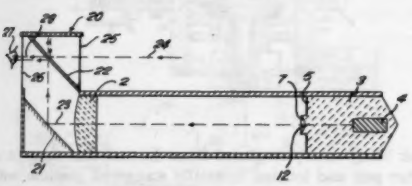
Raymond G. Budden, Havant; Fraser Scott, and Ivan F. R. Dickinson, both of Guildford, all of England, assignors to Ring Sights Limited, Guildford, England

Filed Apr. 5, 1977, Ser. No. 784,659

Claims priority, application United Kingdom, Apr. 9, 1976, 14595/76

Int. Cl.² G02B *27/34*

U.S. Cl. 356—251 **9 Claims**



1. A collimator gunsight comprising a body containing a collimator lens, means forming a transparent graticule pattern in the focal plane of the collimator lens, a window to ambient light behind the graticule forming means and an artificial light generator located between the graticule forming means and the window, the graticule forming means having a first transparent portion through which light from the artificial light generator passes directly into the aperture of the collimator lens and a second transparent portion, said generator being sufficiently small and so spaced behind the graticule forming means that ambient light entering the body through the window can bypass the generator to illuminate at least said second portion of the graticule pattern, said second portion being arranged to divert said illuminating ambient light substantially to fill the aperture of the collimator lens.

4,136,964

APPARATUS FOR SIMULTANEOUSLY MIXING AND CONVEYING PARTICULATE MATERIAL

George W. Swisher, Jr., Oklahoma City, Okla., assignor to CMI Corporation, Oklahoma City, Okla.

Filed Apr. 14, 1977, Ser. No. 787,306

Int. Cl.² B28C *5/46*

U.S. Cl. 366—23 **17 Claims**

1. Apparatus for simultaneously mixing and conveying a particulate material, comprising:

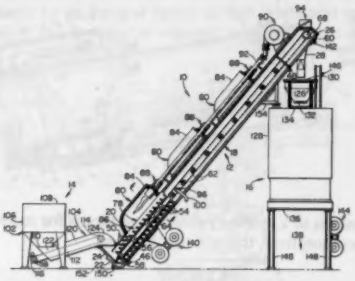
a housing having an input end and an output end disposed vertically higher than the input end;

means for feeding particulate material into the input end of the housing;

conveyor means disposed within the housing and extending from the input end to the output end thereof for lifting the particulate material from the input end to the output end of the housing, the conveyor means including a plurality of lifting surfaces having perforations therethrough, whereby a portion of the particulate material being lifted by each lifting surface descends through the perforations and is mixed with particulate material being lifted by lifting surfaces disposed therebelow;

means for discharging the mixed particulate material from the output end of the housing;

burner means connected to the housing for heating the particulate material in the housing; and,



means for injecting asphaltic oil into the medial portion of the housing, whereby the asphaltic oil is mixed with the heated particulate material to form a hot mix asphalt.

4,136,965

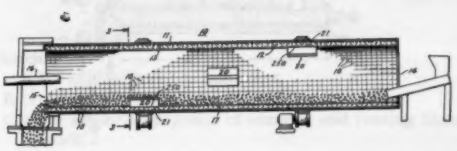
MIXER BLOCK FOR USE IN ROTARY DRUMS

Carl E. Sunnergren, Bethlehem; John K. Simms, Bath, and Dale W. Brinker, Allentown, all of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 31, 1978, Ser. No. 892,367

Int. Cl.² B28C *5/46*

U.S. Cl. 366—25 **37 Claims**



1. A mixer block suitable for use in the interior of a rotary drum to mix, dry, cool, heat or calcine solid particles of a material, comprising a base surface and two converging side surfaces arranged to form a generally triangular shape in cross-section, one of said converging side surfaces being a leading surface and the other of said converging side surfaces being a trailing surface, and end surfaces, and two included angles formed by the intersection of the base surface and the two converging side surfaces, the included angle formed by the intersection of the leading surface and base surface being between plus 10° and minus 10° of the angle of repose of the material in the rotary drum.

4,136,966

ASPHALT SLEEVE MIXER APPARATUS

Robert L. Mendenhall, 1770 Industrial Rd., Las Vegas, Nev. 89102

Continuation of Ser. No. 616,910, Sep. 26, 1975, abandoned, which is a continuation-in-part of Ser. No. 488,518, Jul. 15,1974, Pat. No. 4,000,000 and Ser. No. 601,177, Aug. 1, 1975, Pat. No. 4,034,968. This application Jan. 10, 1977, Ser. No. 758,316

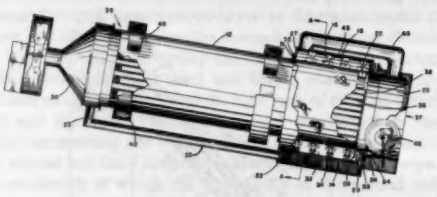
Int. Cl.² B28C *5/06*

U.S. Cl. 366—25 **12 Claims**

1. In a mixing apparatus for asphalt-aggregate compositions including a rotatable cylindrical drum, means for introducing composition at an input drum end and means for recovering composition at an opposite output drum end, the improvement comprising:

a sleeve extending around the drum exterior from the output end along a portion of the drum length, the sleeve and drum exterior defining a mixing chamber therebetween, port means communicating between the mixing chamber and the drum interior for directing composition from the

drum interior to the mixing chamber, means in the mixing chamber for advancing the composition therein from the



port means to a recovery means, and means for recovering composition from the mixing chamber.

4,136,967

SCREW MACHINE FOR THE CONTINUOUS DEGRADATION OF PLASTICS

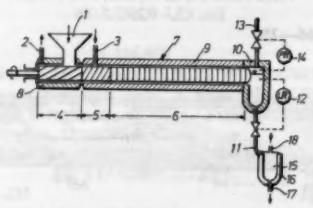
Ernst Grigat, and Hartmut Hetzel, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 608,853, Aug. 29, 1975, Pat. No. 4,051,212. This application Jul. 18, 1977, Ser. No. 816,637

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1974, 2442387

Int. Cl.[2] B29B *1/10*; B01F *7/08*

U.S. Cl. 366—82 **3 Claims**



1. A screw machine consisting of

a. a tubular housing having

1. an air vent means, 2. a water inlet means

3. a material feed hopper means located between said vent means and said inlet means, and

4. a material outlet nozzle provided with

i. a pressure measuring and regulating means, and ii. a liquid level measuring and regulating means,

b. a screw shaft arranged in said housing, said screw shaft comprising

1. a first screw threaded section of high pitch extending beyond said feed hopper means in the direction of flow,

2 adjacent to said first section, a second screwthreaded section of lower pitch than said first section, and

3. adjacent to said second section, kneading discs fitted to said screw shaft, said water inlet means opening into said second section.

4,136,968

MULTI-SCREW, CONTINUOUS, MATERIAL PROCESSING SYSTEMS

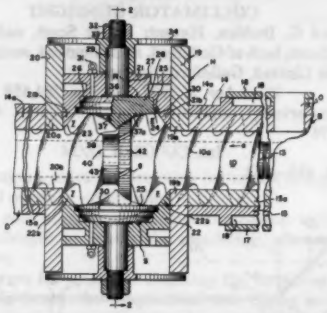
David B. Todd, Saginaw, Mich., assignor to Baker Perkins Inc., Saginaw, Mich.

Continuation-in-part of Ser. No. 636,030, Nov. 28, 1975, abandoned. This application Jul. 27, 1977, Ser. No. 819,227

Int. Cl.[2] B01F *7/02*; B29B *1/10*

U.S. Cl. 366—85 **25 Claims**

1. In a continuous processor having: a longitudinally extending barrel housing, with a material supply opening and a downstream discharge opening, configured to form an axially extending processing barrel with at least twin interconnected cylinders therein and wherein the distance between the axes of the twin cylinders is substantially equal to or less than twice the radius of the cylinders and the housing has saddle portions of generally V cross section at the points of interconnection of the cylinders; and at least a pair of parallel longitudinally extending rotatable shafts with radially intercooperating material forwarding portions thereon configured to wipe the cylinders including the saddle portions, the improvement comprising: radially adjacent pairs of co-wiping elements on said shafts downstream from the material supply opening at a flow control station, the co-wiping elements of each pair being received in different cylinders, one element of each pair being of full bore shape to substantially block flow through one of the cylinders by leaving only wiping clearance between the said element and cylinder, and the other element of each pair being of reduced size and permitting flow through the cylinder in which it is disposed adjacent its periphery, the first element of



one pair being axially displaced from the said first element of the other pair and located in axially staggered position with respect to it on a different shaft, and each being located radially opposite the said second element on the other shaft in co-wiping relationship therewith; the second element of one pair also being located in axially staggered relation with respect to the second element of the other pair; and a movable flow restricting part, disposed to interact with said elements at the flow restricting station to tend to back up the flow, and mounted to move toward and away from a position in which it permits less restricted flow; the barrel having a degassing vent opening therein radially downstream from the location where the flow restricting part tends to back up the flow of material.

4,136,969

MIXING APPARATUS

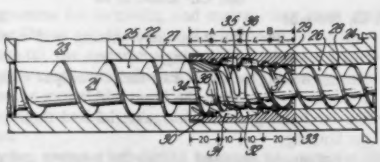
Paul Meyer, Wiesbaden, Fed. Rep. of Germany, assignor to Frenkel C-D Aktiengesellschaft, Vaduz, Luxembourg

Filed Jul. 7, 1977, Ser. No. 813,702

Claims priority, application United Kingdom, Jul. 14, 1976, 29328/76; Jun. 14, 1977, 25013/77

Int. Cl.[2] A21C *1/06*; B01F *7/08*

U.S. Cl. 366—88 **17 Claims**



1. A continuous mixer comprising at least one mixing zone formed by a Transfermix geometry, said Transfermix geometry being defined by an exterior component having an internal operating surface provided with a first helical thread and an interior component having an external operating surface provided with a second helical thread of different direction from but coaxial with said first helical thread, said first and second helical threads facing one another and defining therebetween said one mixing zone, said first and second helical threads

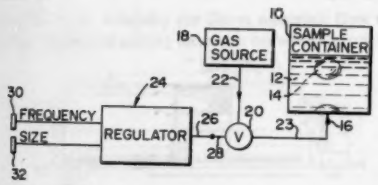
defining respective first and second helical grooves therebetween of predetermined cross-sectional areas, each of said first and second helical threads having starts, the number of said starts of said first and second helical threads change at different locations for each of said interior and exterior components along the length of said Transfermix zone in the opposite sense to the change of the cross-sectional area at different locations of said helical grooves on said interior and exterior components whereby when in operation a medium moves along said Transfermix zone and portions thereof are successively transferred between the grooves of facing helical threads, and grooves of larger cross-sectional area are of greater widths than grooves of small cross-sectional area.

4,136,970

METHOD AND APPARATUS FOR REGULATING THE SIZE AND FREQUENCY OF BUBBLES EMPLOYED FOR MIXING LIQUIDS

Pedro P. Cabrera, and Robert T. Duncan, both of Miami, Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed Dec. 15, 1977, Ser. No. 860,674
Int. Cl.² B01F *13/02*
U.S. Cl. 366—101 **23 Claims**



1. Method for generating bubbles for use in mixing sample material in a container, said method comprising the steps of: defining discrete quantums of a substance having a density less than the density of the sample material, and injecting said quantums separately in time spaced sequence into the container near its bottom, said defining and injecting being coactive such that each separate quantum forms a bubble of the substance that will rise through sample material in the container and in so rising will mix the sample with a minimum of turbulence.

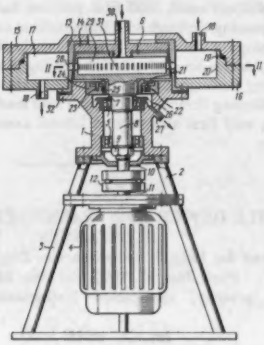
4,136,971

APPARATUS FOR CREATING ACOUSTIC OSCILLATIONS IN A RUNNING LIQUID MEDIUM

Vladimir M. Variamov, ulitsa 50 let Oktyabrya, 1, kv. 16; Anatoly I. Sopin, prospekt Gagarina, 4 linia, 2, kv. 7, both of Zlatoust Chelyabinskoi oblasti; Vasily F. Judaev, ulitsa Polyarnaya, 52, korpus 4, kv. 557, Moscow; Jury P. Romanov, prospekt Gagarina, 2 linia, 3, kv. 78, Zlatoust Chelyabinskoi oblasti; Dmitry T. Kokarev, ulitsa K. Marxa, 21/4, kv. 29, Moscow; Alexandr Z. Metelyagin, ulitsa Dvortsovaya, 14-24, Zlatoust Chelyabinskoi oblasti; Vladislav A. Shestakov, ulitsa Dvortsovaya, 9, kv. 71, Zlatoust Chelyabinskoi oblasti; Vladimir I. Fomin, ulitsa Zelenaya, 30, kv. 67, Zlatoust Chelyabinskoi oblasti, and Vladimir A. Filin, prospekt Mira, 20, kv. 58, Zlatoust Chelyabinskoi oblasti, all of U.S.S.R.

Filed Apr. 22, 1975, Ser. No. 570,497
Int. Cl.² B01F *11/02, 07/28*
U.S. Cl. 366—169 **6 Claims**

1. An apparatus for creating acoustic oscillations in a running liquid medium comprising: a working chamber; openings in said working chamber for outlet of said liquid medium; a stator in the form of a hollow cylinder in said working chamber; a row of apertures in the peripheral surface of said stator; a rotor in the form of a cylinder with closed ends in said working chamber coaxially with said stator; a closed internal space of said rotor; an opening in one of said ends of said rotor for admitting said running liquid medium to said internal space of said rotor; a row of apertures in the peripheral surface of said rotor, the number of said apertures of the rotor being greater than the number of said apertures in the peripheral surface of said stator by an integral factor so that when said apertures of said rotor are brought in register with said apertures of said



stator at regular intervals, said running liquid medium is admitted from said closed internal space to said working chamber, the width a of said apertures in the peripheral surface of said rotor and stator in the cross-section being selected on the basis of the relationship

$$a \leq \frac{2R^2\omega}{C}$$

wherein

ω is the angular speed of said rotor,

R is the external radius of said rotor,

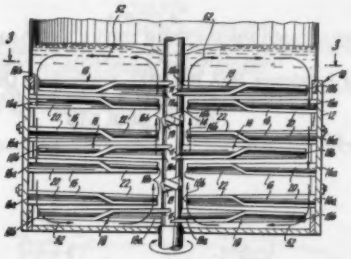
C is the rate of propagation of sound in said running liquid medium.

4,136,972

PREMIXER

Lewis G. Doom, 95 Meadow Farm Rd., East Islip, N.Y. 11730

Continuation of Ser. No. 590,578, Jun. 26, 1975, abandoned.
This application Oct. 12, 1976, Ser. No. 731,776
Int. Cl.² B01F *7/20, 7/22*
U.S. Cl. 366—262 **10 Claims**



1. Mixing apparatus including a housing having a central axis;

a rotatable shaft disposed along said central axis and adopted to rotate in a predetermined direction; and

a first and second group of interdigitated members each member having a leading and a trailing edge when said shaft rotates in said predetermined direction, a longitudinal axis and first and second ends, each of said first group of members being attached at said first end to said rotatable shaft and extending outwardly from said rotatable shaft toward said housing and each of said second group

of members being attached at said first end to said housing and extending inwardly from said housing toward said shaft, and all of said members of both said first and said second groups of members comprising shaped members, each of said shaped members including first and second longitudinal portions adjacent respectively to said first and second ends, said first portion having a first lateral axis passing through said longitudinal axis, said first lateral axis sloping downwardly from said leading to said trailing edge, and a second portion having a second lateral axis passing through said longitudinal axis, said second lateral axis sloping downwardly from said leading to said trailing edge, said first and second lateral axes forming an acute angle.

4,136,973

MOBILE DEVICE FOR TRANSPORTING LIQUID SUBSTANCES

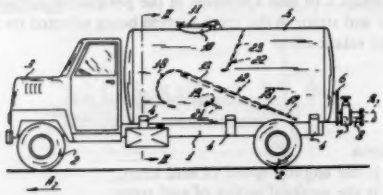
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Jun. 27, 1977, Ser. No. 810,615

Claims priority, application Netherlands, Jul. 1, 1976, 7607261

Int. Cl.² B01F *5/10*

U.S. Cl. 366—219 **50 Claims**



1. A mobile device for transporting a mixture of a liquid and further substances, said device comprising a tank, a frame supporting said tank, at least one guide member arranged in said tank at an acute angle to a horizontal plane, said angle opening to the front as viewed in the usual direction of movement of the device, said guide member cooperating with movement of the device during transportation for performing the function of preventing dissociation of the mixture of liquid and further substances in said tank, said guide member extending within said tank for only part of the height of said tank.

4,136,974

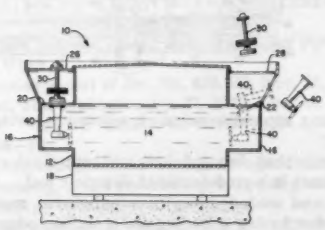
SEAL AND PROPELLER DRIVE ASSEMBLY FOR INDUSTRIAL CLEANING TANKS

John J. Palotsee, P.O. Box 1127, Youngstown, Ohio 44501

Filed Aug. 10, 1977, Ser. No. 823,466

Int. Cl.² B01F *7/06*

U.S. Cl. 366—283 **7 Claims**



1. An industrial cleaning machine including a tank for receiving cleaning liquid therein, which tank has an offset, vertically extending ear portion at one area of its periphery, an apertured top plate for said tank extending over and forming a cover enclosure for said ear portion, a support flange means on said tank above said top plate, a propeller and drive unit including a housing operably secured to said top plate and extending downwardly of the tank for stirring action, drive means for said propeller and drive unit operably carried by said tank and including a stub shaft telescopically engaging said propeller and drive unit and journalled on and extending between said top plate and support flange means to be removable separately from said propeller and drive unit, said propeller and drive unit being of substantially L-shape, said aperture of said top plate being of a size to permit said propeller and drive unit to be removed therethrough.

4,136,975

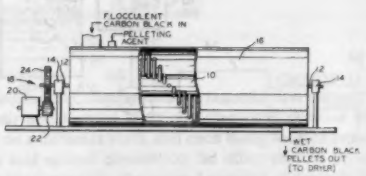
CARBON BLACK PELLETER

Glenn J. Forseth, Toledo, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 10, 1978, Ser. No. 885,403

Int. Cl.² B01F *7/08*

U.S. Cl. 366—325 **20 Claims**



1. A carbon black pelleter comprising:

a shell;

a shaft rotatably supported in the shell;

means for rotating said shaft in said shell; and

a plurality of pins each having an upstream and downstream edge and mounted on said shaft and projecting radially therefrom, said pins being positioned in a plurality of rows defining helical flights positioned along the length of the shaft, said pins being arranged such that azimuthally adjacent pins in each helical flight are axially spaced along the shaft a distance greater than the axial distance between the upstream and downstream edges of each pin and less than twice the axial distance between the upstream and downstream edges of each pin, each pin of a first helical flight of pins being axially spaced along the shaft an axial distance from a corresponding pin of a second helical flight of pins angularly displaced therefrom about the axis of the shaft through an angle of 180°, said last mentioned axial distance being less than the axial spacing between azimuthally adjacent pins of a helical flight.

4,136,976

STATIC MIXING DEVICE

Victor C. Leffelman, Oak Forest, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

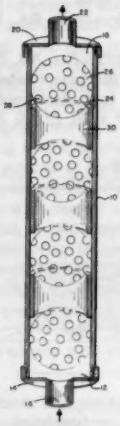
Filed May 23, 1977, Ser. No. 799,483

Int. Cl.² B01F *5/06*

U.S. Cl. 366—336 **4 Claims**

1. A static mixing device for mixing a plurality of fluent materials comprising, a hollow cylindrical housing having an inlet and an outlet, and a plurality of hollow spherical mixing members within said housing having outer diameters slightly less than the interior diameter of said housing, each of said

mixing members not being connected to said housing, each said mixing member having a large number of openings for fluent



material flow, whereby the fluent materials flow through the hollow spherical mixing members between the inlet and outlet.

4,136,977

MOUNT FOR A CONSUMABLE ELECTRODE MATRIX PRINTER

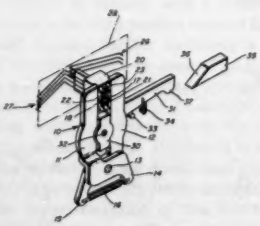
Otto Krauss, Stein-Deutenbach, and Josef Lendl, Ottensoos, both of Fed. Rep. of Germany, assignors to Triumph Werke Nurnberg A.G., Nurnberg, Fed. Rep. of Germany

Filed Sep. 20, 1977, Ser. No. 834,980

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1976, 2646783

Int. Cl.[2] B41J *3/20*

U.S. Cl. 400—120 **5 Claims**



1. In combination in a mount for a consumable electrode printer, at least one consumable electrode, first means comprising a resilient member for slidably receiving said consumable electrode, biasing means for said consumable electrode, clamp means engaging opposite sides of said resilient member for gripping said electrode to prevent the sliding thereof, and second means for relaxing said gripping means whereby said biasing means advances said electrode to a printing position.

4,136,978

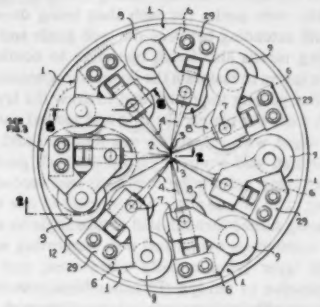
HIGH SPEED ELECTROMAGNETIC PRINTING HEAD

James E. Bellinger, Jr., Melbourne, and John H. MacNeill, Indialantic, both of Fla., assignors to Optical Business Machines, Inc., Melbourne, Fla.

Continuation of Ser. No. 621,526, Oct. 10, 1975, abandoned. This application Nov. 11, 1977, Ser. No. 850,848

Int. Cl.[2] B41J *3/12*

U.S. Cl. 400—124 **18 Claims**



1. A stylus printer mechanism comprising a plurality of stylus drivers, each of which includes:

an arm lying in a first plane and having a first end for supporting a stylus substantially perpendicular to said arm and a second end,

means for pivotally supporting said second end of said arm,

a body of magnetic material disposed in said arm adjacent said second end of said arm, and

a magnetic structure providing a continuous magnetic path having a single gap therein and including a permanent magnet and an electromagnet having a pole piece, said gap located adjacent said pole piece,

said magnetic structure lying in a second plane, said second plane lying at an angle to said first plane, said magnetic structure and said arm intersecting only in the region of said body of magnetic material,

said body of magnetic material being disposed in said gap adjacent said pole piece and forming the armature of said electromagnet.

4,136,979

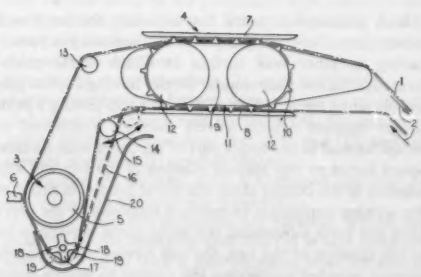
PAPER GUIDANCE SYSTEMS

Ronald N. Piper, London, England, assignor to Data Recording Instrument Company Limited, Great Britain

Continuation of Ser. No. 700,719, Jun. 28, 1976, abandoned. This application Nov. 3, 1977, Ser. No. 848,064

Int. Cl.[2] B41J *15/00*

U.S. Cl. 400—616.2 **2 Claims**



1. Apparatus including a platen rotatable about a first axis in

a printer comprising a continuous cylindrical web supporting surface on said platten; a web guide freely rotatable about a second axis parallel with said first axis and comprising a plurality of arms extending radially from the second axis, each arm terminating in a two-dimensional web engaging surface, said web guide having web receiving recesses between the web engaging surfaces; a web comprising an outer layer and a plurality of inner layers; feeding means operative to engage continuously the layers to register the layers with one another and to feed the layers from the feeding means along a first path towards the web guide, the web then being drawn along a second path extending between the web guide and the platen; said feeding means also being operative to continuously re-engage the layers to maintain the layers in registration with one another after passing the platen and to draw the layers along a third path from the platen, the first and second paths being at an acute angel with respect to one another, said web being turned through said acute angle by the web guide and said outer layer lying radially outermmost; said second and third paths being at an obtuse angle with respect to one another and the web being turned through said obtuse angle by engagement with said continuous cylindrical web supporting surface with said outer layer lying radially outer-most; and tensioning means operative to tension the outer layer, the inner layers tending to wrinkle during passage around the web guide, said recesses being effective to accommodate the wrinkles and thereby ensure that registration of the layers is maintained during engagement of the web with the platen.

4,136,980

MECHANICAL PENCIL

Tae Yoon Leem, 310-92ka, Sungsu-Dong, Sungdong-Ku, Seoul, Rep. of Korea

Filed Apr. 12, 1977, Ser. No. 786,857
Int. Cl.[2] B43K *21/08, 27/14*
U.S. Cl. 401—31 **4 Claims**

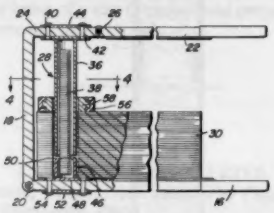
1. A mechanical pencil for adjusting the back and forth movements of a writing implement comprising: a pencil barrel having an inner wall surface in which spiral grooves are formed; a hollow part-annular carrier having a spiral guide that travels along the spiral grooves; and a cap having a protruding holder member which travels through a rounded circular recess formed in the upper part of the inner wall surface of the pencil barrel so that manual rotation of the cap will adjust the rotation of the carrier along the spiral groove in order to cause the writing implement to move in response to the carrier in a back and forth movement, the spiral guide moving in response to the rotation of the cap, the cap having a part-annular supporting member contacting the carrier to define therewith a hollow annular member with said carrier and said supporting member each partly surrounding the writing implement.

4,136,981

LOOSE LEAF BINDER WITH FLEXIBLE TELESCOPIC POST ASSEMBLIES AND MAGNETICALLY RETAINED BAR

James P. Stecklow, 8558 Broadview Rd., Broadview Heights, Ohio 44147

Filed Apr. 28, 1977, Ser. No. 792,035
The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.
Int. Cl.[2] B42F *3/00, 13/30, 13/12*
U.S. Cl. 402—46 **8 Claims**



1. A loose leaf binder for loose leaf sheets or brochures and enabling individual sheets or brochures to be removed or added without taking the binder apart and without removing additional sheets or brochures, said binder comprising a base member, a top member spaced from the base member and adapted to receive a plurality of loose sheets of material therebetween, a plurality of post assemblies extending between the base member and top member and receiving and mounting the loose leaves, each post assembly including a pair of tubular members with one of the tubular members extending from the base member and the other of the tubular members extending from the top member, the inner ends of the tubular members forming a telescopic relation with each other to enable variation in the length of each post assembly, wherein at least the tubular member forming the outer porton of said telescopic relationship has a rigid portion as a part thereof and at least one of said tubular members has a flexible portion as a part thereof, and

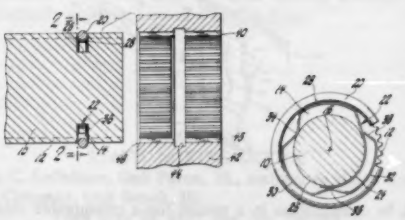
including a paper hold down means which adheres to and is adjustable in relation to a rigid portion of at least one of said plurality of post assemblies for applying sufficient pressure to said sheets to hold them in the binder.

4,136,982

CENTERED FASTENER ASSEMBLY

Daniel V. Sagady, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 4, 1977, Ser. No. 839,373
Int. Cl.[2] F16B *7/10*; F16D *1/12*
U.S. Cl. 403—108 **2 Claims**



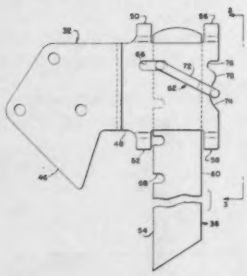
1. A centered retainer assembly for connecting first and second members together in a fixed axial position, said first member having a generally cylindrical extension that telescopes and fits into a corresponding cylindrical opening formed in said second member, said extension and said opening each being formed with a radially extending and annular

groove transversely disposed with respect to the longitudinal axis of said members, said grooves being radially aligned with each other in response to the telescopic movement of said extension into said opening in said second member to a predetermined position, said retainer assembly comprising a curved spring member and a curved resilient snap ring radially disposed with respect to each other operatively mounted in one of said grooves, said spring contacting said last mentioned groove at a plurality of arcuately spaced stations along the bottom of said groove, said spring having a plurality of radially projecting arms contacting said snap ring at a plurality of arcuately spaced peripheral stations to exert a low spring force thereon and to yieldably hold said snap ring in a centered and radially projecting position with respect to said last mentioned groove to facilitate insertion of said extension into said opening, said spring readily constricting in response to deflection of said snap ring by the wall defining said cylindrical opening in response to the telescopic movement of said extension into said opening until said predetermined position is reached at which position said snap ring deflects partially into the other of said grooves to thereby axially secure said members to each other.

4,136,983
DRAG STAKE MOUNTING FOR WALK-BEHIND ROTARY TILLER

Dale R. Dobberpuhl, Horicon, Wis., assignor to Deere & Company, Moline, Ill.

Filed Feb. 21, 1978, Ser. No. 881,407
Int. Cl.² F16B 7/14
U.S. Cl. 403—108 **4 Claims**

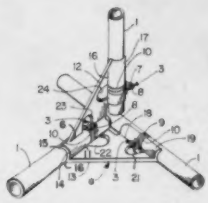


1. A drag stake mounting for a walk-behind rotary tiller comprising: a bracket defining a socket; a drag stake slidably received in the socket and including a leading surface in which is located a plurality of spaced notches; an elongate hole extending transversely through the bracket and including a rearward portion located to register with a selected one of said spaced notches and a forward portion located forwardly of the drag stake; said bracket further including a notch located rearwardly of the drag stake in general alignment with the elongate hole; a lock member having a first transverse section disposed in said hole and a second transverse section located behind the drag stake and spaced from the first transverse section such that when the lock member is in an unlock position wherein the second transverse section is located forwardly in the notch in the bracket the first transverse section will be disposed in the forward portion of the hole and free of the selected one of said spaced notches whereby the drag stake may be slid in the socket to bring a different one of the spaced notches into register with the elongate hole; said bracket further including a resting surface separated from the notch in the bracket by a retaining surface spaced from a rear surface of the one of said spaced notches a distance substantially equal to the distance between the first and second transverse sections of the lock member; said resting surface being spaced from the elongate opening such that when the lock member is in a lock position with the second transverse section engaging said resting surface the first transverse section will be located with the selected one of said spaced notches in the drag stake.

4,136,984
CLAMP-CONNECTOR FOR JOINING TUBULAR MEMBERS

Henry T. Hayashi, 2373 Abreu Rd., Union City, Calif. 94587

Filed Jun. 20, 1977, Ser. No. 808,044
Int. Cl.² F16B 7/04
U.S. Cl. 403—170 **2 Claims**



1. A structural system comprising:
a. three structural circular elongated tubular members (1);
b. a bracket member including:
1. a first triangular web member (12) formed with a straight first inner edge (6) and a straight first edge (16) positioned at right angles to one another and also formed with a first opening (24) adjoining said first edge (16) and a second opening (23) adjoining said first inner edge (6),
2. a second triangular web member (13) formed with a straight second inner edge (11) and a straight second edge (18) positioned at right angles to one another and also formed with a third opening (21) adjoining said second edge (18) and a fourth opening (22) adjoining said second inner edge (11),
3. a first circular quarter-arc elongated curved portion (14) for receiving one of said tubular members (1) having a straight outer edge (15) connected to first inner edge (6) of said first web (12) and also having a second inner edge (16) joined to said second inner edge (11) of said second web (13) so that said first and second webs are connected at right angles to one another,
4. a second circular quarter-arc elongated curved portion (17) for receiving another of said tubular members (1) and connected along an edge to said first edge (16) of said first web member (12) and positioned at right angles to said first curved portion (14),
5. a third circular quarter-arc elongated curved portion (19) for receiving still another of said tubular members (1) and connected along an edge to said second edge (18) of said second web (13) and positioned at right angles to said first and second curved portions (14) and (17),
6. said curved portions are positioned with respect to said web portions so that said structural circular tubular members cradled in said curved portions are adapted to intersect one another,
c. a plurality of clamp members (3), each including:
1. a strap member (10) formed with a plurality of slots (9) and inserted through said openings (21–24) and encirculing said curved portions (14), (17), and (19) and said tubular members (1) cradled therein,
2. a housing (5) formed with a U-shaped member for receiving and holding said strap (10),
3. a worm gear (4) journaled for rotation within said housing (5) for engaging said slits (9) in said strap (10) and also formed with a tool engaging head for manual rotation of said worm gear;
d. said clamp members are selected so that a screw driver or hand wrench is capable of pulling said straps (10) in such

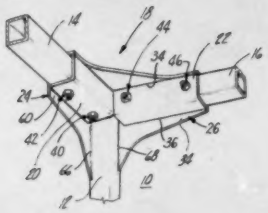
close fitting frictional engagement around said tubular members (1) and said curved portions (14), (17), and (19) that said structural tubular members cannot move with respect to said bracket member.

4,136,985

CORNER STRUCTURE

Niels A. Taul, Kokkedal, Denmark, assignor to Massey-Ferguson Inc., Detroit, Mich.

Filed Jul. 7, 1977, Ser. No. 813,574
Int. Cl.[2] B60R 21/00
U.S. Cl. 403—172 **10 Claims**



1. A corner structure for a vehicle roll over protective structure having three members coming together to form a corner thereof for slidably receiving at least one member therein comprising: an outer member for receiving the corner members, at least one inner member, an unbroken face on said outer member adjoining at least one corner member, a first extension on said outer member extending generally perpendicularly outwardly from said face and a second extension generally perpendicular to said face and first extension, said second extension extending outwardly from said face, said first and second extension adjoining and being nondetachably affixed to a second corner member to form a common unbroken surface for the entire surface of said outer member, a first leg on said inner member spaced from and parallel to said outer member face, a second leg on said inner member generally perpendicular to said first leg and parallel to and spaced from said outer member first extension, said first and second inner legs nondetachably affixed to and abutting said outer member face and first extension, respectively, and together therewith encompassing said one corner member, said inner member having a length extending over most of the length common to both said one corner member and outer member first extension and means fastening said one corner member to said corner structure by passing through both said structures.

4,136,986

AUTOMOBILE ANTENNA MOUNT STRUCTURE

Joseph Grashow, Brooklyn, and Jan H. Krom, New York, both of N.Y., assignors to Quick-Mount Manufacturing Company, Inc., Brooklyn, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,151
Int. Cl.[2] H01Q 1/12
U.S. Cl. 403—197 **7 Claims**

1. An antenna mounting structure for mounting an antenna within an aperture formed in a support surface comprising:

a base for supporting the antenna having laterally spaced-apart shouldered portions thereon, said shouldered portions curved in a vertical plane;

elongated lower retainer means adapted to pass endwise through the support surface aperture and having a longitudinal bore of laterally elongated cross-section therethrough;

a pair of spaced apart downwardly depending legs on said lower retainer means having bearing portions shaped to match the shouldered portions on the base and arranged to provide pivotal engagement between said base and said lower retainer means;

upper retainer means having an opening therein through which said base is adapted to extend; and

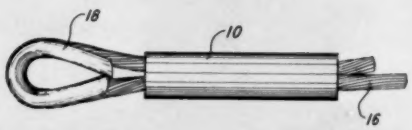
means for clamping the base and lower retainer means to the upper retainer with the support surface therebetween and a portion of the base extending through the lower and upper retainer means and the aperture in said surface.

4,136,987

MECHANICAL SPLICE FOR WIRE STRANDS

Dante Tettamanti, Pierrefonds, Canada, assignor to Wire Rope Industries Ltd., Montreal, Canada

Filed Aug. 16, 1977, Ser. No. 825,542
Claims priority, application Canada, Dec. 20, 1976, 268246
Int. Cl.[2] F16G 11/02
U.S. Cl. 403—212 **6 Claims**



1. A mechanical splice for forming turn-back loop ends in wire strands having a breaking strength which is over 100% of the nominal breaking strength of the wire strands, comprising an elongated element of extruded aluminum having two longitudinal smooth bores parallel to the axis of the element and separated by a partition having a minimum thickness of $\frac{1}{4}$ inch, each bore being of a diameter slightly larger than the diameter of the strand for insertion of the main body of the strand in one of the bores and of the turn-back end of the strand in the other and the length of the elongated element also being at least a minimum predetermined multiple of the diameter of the strand.

4,136,988

ROUND-NOSE FRAME JOINT

Eugene M. Nist, Tacoma, Wash., assignor to Seattle Box Co., South Kent, Wash.

Filed Nov. 3, 1976, Ser. No. 738,477
Int. Cl.[2] B25G 3/00; F16B 7/00
U.S. Cl. 403—231 **2 Claims**

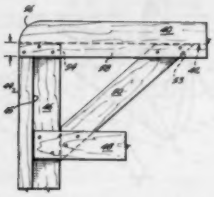
1. A round-nosed corner joint for a wooden bedding furniture frame in which two wooden structural members are jointed at right angles, comprising:

a first elongated member 40 having a non-rabbetted longitudinal portion and an inside edge rabbet 42 extending con-

tiguously parallel along said non-rabbetted portion from the joint end of said member;

said edge rabbett **42** providing an edge flange **58** having a thickness which is substantially one-half the thickness of said first member **40**, the width of said flange being approximately one-third the width of said first member **40**, and one face of said flange being coplanar with a face of said non-rabbetted portion;

said first member **40** having an accurately rounded joint end, the curvature **56** of which is restricted to between and



coextensive with the outer edge and the end of the non-rabbetted portion of said first member **40**; one end of said curvature merging tangentially with the adjacent end of said flange **58**;

a second member **44** of a thickness equal to said first member **40**, and having a transverse rabbet **54** at its end forming a flange of a width and thickness to fit into said edge rabbet and, in coplanar manner, interfitting said first and second members; and

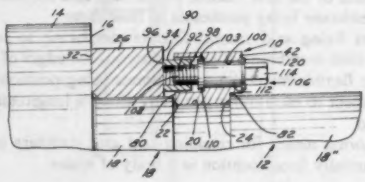
means fixedly securing said members in their interfitted relation.

4,136,989

EXPANDABLE ANNULAR CAM-TYPE LOCKING DEVICE FOR A SHAFT

Romolo P. Bianco, 2803 Grindley Pk., Dearborn, Mich. 48124

Filed May 18, 1977, Ser. No. 798,077
Int. Cl.² F16B *21/00*
U.S. Cl. 403—261 **22 Claims**



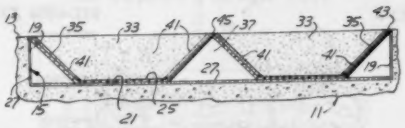
1. In combination, a shaft of varying diameter, with a first portion of the shaft containing a first abutment and with a second portion of the shaft having a diameter smaller than the first portion and being provided with an annular groove having oppositely facing second and third abutments which are axially aligned with and spaced from said first abutment, at least one sleeve-like element mounted on said second portion of the shaft at the side of said groove closest to said first abutment for engagement therewith, and an annular locking device for retaining said sleeve-like element against said first abutment, said locking device being formed by a pair of members disposed in said annular groove about opposite portions of said shaft, each of said members having a pair of first and second flat surfaces which face said second and third abutments respectively, said members having curved recesses in said first face located radially outwardly from the second portion of said shaft, cam inserts received in said recesses and movable therein axially of said shaft, said inserts each having a pair of faces with one face opposite and engageable with the sleeve-like element, and first means carried by said members and connected to said inserts for expanding and urging said inserts against the sleeve-like element and in turn against said first abutment, with said second flat surfaces bearing against said third abutment.

4,136,990

HIGHWAY MARKER

Alan W. Morgan, 328 Ferndale, Rochester, Mich. 48063

Filed May 30, 1978, Ser. No. 910,447
Int. Cl.² E01F *9/00*
U.S. Cl. 404—9 **10 Claims**



1. A highway marker comprising a metallic or plastic body of rectangular shape adapted for nesting within a recess formed in a roadway;

said body having upright side and end walls and a flat bottom wall;

opposed downwardly and inwardly inclined inner side walls along the length of said body extending to and merging with said bottom wall;

opposed downwardly and inwardly inclined inner end walls along the width of said body extending to and merging with said bottom wall;

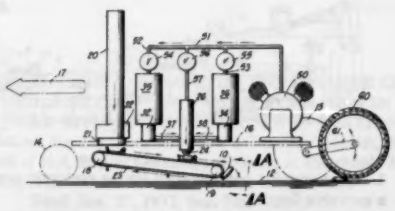
and a reflectorized layer upon each of said inclined walls, said marker providing a visual guide, and readily noticable vibrations to aid in lane identification.

4,136,991

ROADWAY MARKER AND PROCESS OF AND APPLICATION FOR PRODUCING THE SAME

Elin R. Clark; Benny J. Clark, both of Rte. 1, Box 219F, Lindale, Tex. 75771, and Jerry M. Lang, Lindale, Tex., assignors to Elin R. Clark and Benny J. Clark, both of Lindale, Tex.

Filed Jun. 2, 1977, Ser. No. 802,817
Int. Cl.² E01F *9/04*
U.S. Cl. 404—73 **12 Claims**



1. Process of producing a roadway marker comprising:

(a) disposing an upwardly open mold of a roadway marker in a position adjacent to a roadway;

(b) filling said mold with a plastic which will set up after being placed in the mold;

(c) inverting the mold containing the plastic onto a roadway surface for depositing said plastic and said mold onto the roadway surface, while said plastic is in a fluid condition and is still within said mold, so that the plastic will adhere to said surface; and

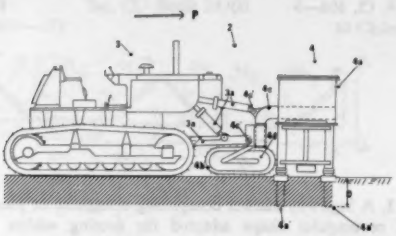
(d) permitting said plastic to set up while maintaining the shape of said plastic as imparted by said mold so that a monolithic plastic structure is produced adhered by its lower portion to the surface of said roadway.

4,136,992

METHOD OF STABILIZING GROUND OF LOW BEARING CAPACITY, AND A STABILIZING UNIT FOR CARRYING OUT THE METHOD

Gunnar Olsson, Svartkarrsvagen 24, 133 00 Saltsjobaden, Sweden

Filed Feb. 7, 1978, Ser. No. 875,936
Claims priority, application Sweden, Feb. 11, 1977, 015733/77
Int. Cl.[2] E01C *21/00*
U.S. Cl. 404—76 10 Claims



1. A method of in situ stabilizing a ground surface whose bearing capacity is so low that it is unable to satisfactorily support a stabilizing machine used to stabilize the surface, the stabilizing machine being adapted to introduce a stabilizing agent into the ground, the method comprising the steps of:

using a stabilizing unit carried in front of a drive unit of the stabilizing machine to stabilize the ground to a width exceeding the width of the drive unit of the stabilizing machine; and

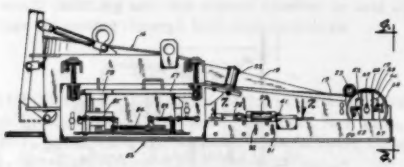
introducing the stabilizing agent into the ground to a depth of such magnitude, and driving the machine at such a speed that the ground is sufficiently stabilized by said stabilizing agent introduced thereinto to support the whole of the stabilizing machine.

4,136,993

APPARATUS FOR FORMING KEYWAY JOINTS

Lawrence J. Fletcher, Ida Grove, Iowa, assignor to Gomaco Corporation, Ida Grove, Iowa

Filed Oct. 13, 1977, Ser. No. 841,843
Int. Cl.[2] E01C *23/02*
U.S. Cl. 404—88 9 Claims



1. Apparatus for continuously laying concrete comprising:

a movable frame;

means attached to said frame for receiving concrete in a plastic condition;

slipforming means attached to said frame behind said receiving means for shaping said concrete into an elongated concrete slab;

means attached to said frame for forming a continuous groove in at least one edge of said concrete slab;

means attached to said frame for lining said groove with a lining;

means attached to said frame for punching a plurality of holes in said lining;

means attached to said frame for automatically placing bars through said openings; and

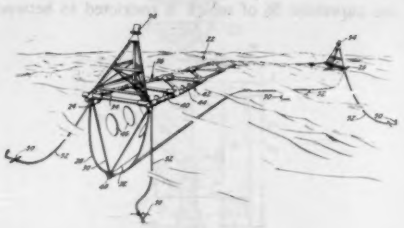
means operably attached to said frame for shutting off said apparatus if said bar placing means malfunctions.

4,136,994

FLOATING BREAKWATER

Richard B. Fuller, 200 Locust St., Apt. 31B, Philadelphia, Pa. 19106

Filed Sep. 19, 1977, Ser. No. 834,249
Int. Cl.[2] E02B *3/06*
U.S. Cl. 405—27 19 Claims



1. A floatable breakwater for dissipating wave energy, said breakwater comprising:

a floatable open grid structure defining first and second ends and first and second longitudinal membrane supports extending between the ends;

a flexible membrane having first and second edges secured to said membrance supports with the width of said membrane between said edges being substantially greater than the lateral distance between said longitudinal membrane supports;

means connected to said membrane for pulling the intermediate region of said membrane downwardly away from said open grid structure to thereby form a trough;

a second flexible membrane between said open grid structure and said first flexible membrane, the second flexible membrane having first and second edges fixed to said membrane supports, the width of the second membrane between its edges being substantially greater than the distance between the membrane supports but less than the width of the first flexible membrane, said second flexible membrane being permeable to fluid flow;

means fixing said second flexible membrane to said first flexible membrane at points between the edges of each of the flexible membranes, the points being positioned with respect to each other generally along a longitudinal line; and

anchoring means for retaining said grid structure in a substantially fixed location in a body of water.

4,136,995

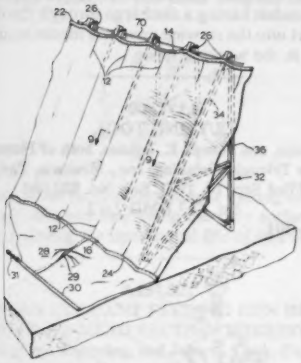
PORTABLE DAMS

Daniel C. E. Fish, 80 Cobham Rd., Ferndown Industrial Estate, Wimborne, Dorset, England

Filed Jan. 20, 1978, Ser. No. 870,863
Claims priority, application Canada, Sep. 28, 1977, 287727
Int. Cl.[2] E02B *7/00*
U.S. Cl. 405—115 8 Claims

1. In a dam comprising a plurality of support posts, said posts being substantially uniformly spaced with respect to one another and having a predetermined pitch spacing, a flexible web having a central body portion and upper and lower marginal

edge portions, the improv wherein said marginal edge portions ar uniformly shortened along the length thereof to a length



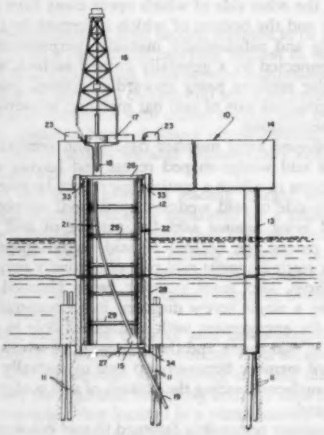
which is less than the unshortened length of the central body portion by a factor of $2/\pi$.

4,136,996

DIRECTIONAL DRILLING MARINE STRUCTURE

Robert B. Burns, Huntington, N.Y., assignor to Texaco Development Corporation, New York, N.Y.

Filed May 23, 1977, Ser. No. 799,633
Int. Cl.[2] E21B *7/12, 7/04, 15/02*
U.S. Cl. 405—195 **9 Claims**



1. A marine structure for drilling wells into the ocean floor at an offshore body of water, said structure including a deck (14) which is positioned above the water's surface, and is adapted to hold well drilling equipment including a rotatable drill string (19),

at least one upstanding leg member (12) supportably connected to said deck (14) and extending downwardly to said ocean floor,

a conductor cage (22) registered in and supportably positioned by said upstanding leg member (12) for a drilling operation, said cage being adapted to be disengaged from and removed from said leg member,

at least one drill string conductor (21) depending from said conductor cage (22) defining a guide passage for registering said rotatable drill string (18), whereby to guide the latter as it is lowered from the deck toward the ocean floor, and

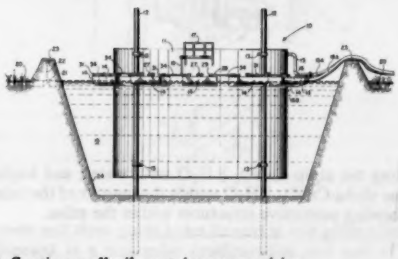
means on said cage (22) for positioning additional drill string conductors thereto when said cage (22) is disengaged from, and removed from said upstanding leg (12).

4,136,997

FLOATING WALL OIL CONTAINER

Marcus R. Chapman, 711 Marshall St., Plaquemine, La. 70764

Filed Nov. 8, 1976, Ser. No. 739,936
Int. Cl.[2] B65G *5/00;* **E21F** *17/16*
U.S. Cl. 405—210 **8 Claims**



1. A floating wall oil container comprising

an upstanding continuous peripheral wall having free upper and lower edges,

a plurality of vertical pilings positioned at spaced intervals around said wall,

sliding connections attached to said wall and slidably mounted on said pilings, said connections restricting movement of said wall to vertical movement,

a plurality of individual floats adjustably interconnected around said wall, said floats being interconnected by a pair of adjustable tie rods extending between said adjacent pair of floats, and there is a swivel connection between said tie rod and associated float and

bracket means releasably connecting each of said floats to said wall.

4,136,998

PROCESS FOR THE DISPOSAL OF THE RESIDUE OF THE EXHAUST GAS WASHERS OF FURNACES IN PARTICULAR BITUMINOUS COAL POWER STATIONS

Friedrich-Karl Bassler, Duisburg, and Klaus Goldschmidt, Essen, both of Fed. Rep. of Germany, assignors to Ruhrkohle AG and Steag AG, both of Essen, Fed. Rep. of Germany

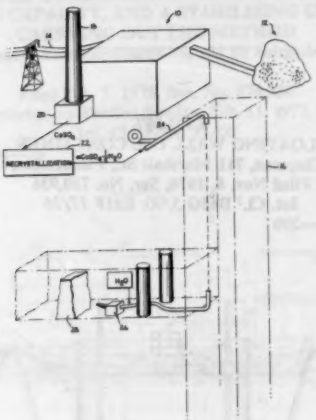
Filed Jan. 27, 1977, Ser. No. 762,965
Claims priority, application Fed. Rep. of Germany, Jan. 31, 1976, 2603699
Int. Cl.[2] E02D *3/14;* **E21F** *15/00*
U.S. Cl. 405—267 **6 Claims**

1. A process for utilizing the residues of a thermal energy power plant washer for forming protective structures within a mine proximate to said power plant comprising the steps of:

reacting the sulfur bearing exhaust gases of the power plant with a calcium compound in the washer to form a $CaSO_4$ compound:

disassociating and recrystallizing substantially all of the $CaSO_4$ compound to form alpha-$CaSO_4 \cdot \frac{1}{2} H_2O$ in dry form by heating the $CaSO_4$ compound with thermal energy obtained from the power plant;

conveying the alpha-$CaSO_4 \cdot \frac{1}{2} H_2O$ in dry form to the interior of the mine;



mixing the alpha-$CaSO_4 \cdot \frac{1}{2} H_2O$ with water; and implacing the alpha-$CaSO_4 \cdot \frac{1}{2} H_2O$ within the interior of the mine for forming protective structures within the mine.

4,136,999

CANOPY AND SHIELD STRUCTURE FOR A SUPPORTING SHIELD IN A SEAM-LIKE MINE DEPOSIT

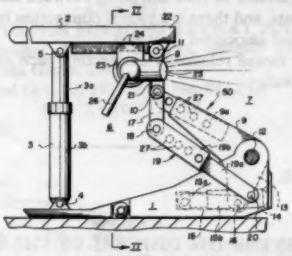
Manfred Koppers, Duisburg, Germany, assignor to Thyssen Industrie AG, Germany

Filed Feb. 2, 1977, Ser. No. 764,871

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1976, 2605068

Int. Cl.[2] E21F *5/06*

U.S. Cl. 405—295 **4 Claims**



1. A canopy and shield structure for supporting a shield adjacent a working face and a seam-like mine depoist having a roof stratification and a working space on one side of the shield and a stowing area on the other side of the shield, comprising a floor skid, a roof canopy overlying said skid having a working end adapted to extend up to the working face of the mine deposit and having an opposite end extending away from the working face, a fluid pressure operated extensible and retractable prop having an upper end pivotally connected to said roof canopy adjacent the operating face end and an opposite end pivotally connected to said skid, a shield extending between the opposite end of said roof canopy and said floor skid including a lower part having a lower end pivotally connected to said floor skid and having an opposite upper end, a substantially vertical upper shield part having an opening therethrough pivotally connected to said roof canopy and said upper end of said lower shield part, a parallel linkage guide means connected between said upper part and said skid and said lower part for guiding said upper part for movement of said upper part to effect movement of said canopy with said upper part maintained substantially perpendicular to the roof stratification, a blast conduit having a discharge through the opening of said upper part into the stowing area, and means mounting said blast conduit in the working space.

4,137,000

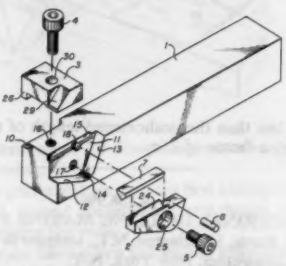
CUTTING TOOL

Victor C. Takacs, and Joseph E. Takacs, both of Houston, Tex., assignors to Triangle Grinding, Inc., Houston, Tex.

Filed Sep. 14, 1977, Ser. No. 833,084

Int. Cl.[2] B26D *1/12*

U.S. Cl. 407—101 **6 Claims**



1. A cutting tool comprising:

an elongated bar member having a wedge-shaped recess at one end thereof, one side of which terminates in a flat surface, the other side of which opens away from said bar member and the bottom of which is formed by a pair of generally and substantially mutually perpendicular surfaces connected by a generally curved surface, said perpendicular surfaces being upwardly inclined, relative to the longitudinal axis of said bar member, as viewed from their intersections;

a wedge shaped anvil member rigidly and removably fastened in said wedge-shaped recess and having an elongated recess in which a cutting insert may be received, at least one side of said wedge-shaped anvil member being flat and lying against said flat surface of said wedge-shaped recess, the bottom of said wedge-shaped anvil member resting against said pair of mutually perpendicular surfaces, said anvil member being fastened in said recess by a single screw disposed in a countersunk hole therein for engagement with a threaded hole in said flat surface of said recess and the tightening of which wedges said anvil member between said pair of mutually perpendicular surfaces forming the bottom of said wedge-shaped recess; and

a clamp member removably fastened to said bar member for rigidly clamping said cutting insert in said elongated recess.

4,137,001

CUTTER BLADE

Edgar A. Fountain, Charlotte, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed May 2, 1977, Ser. No. 792,686

Int. Cl.[2] B26D *1/12*

U.S. Cl. 407—115 **4 Claims**

1. A tooth forming blade for machining hypoid pinion and ring gears, said blade comprising an elongated support shank including a front wall and oppositely disposed side walls and having a cutting end formed on one end thereof a side face formed on one of said side walls adjacent said cutting end at a predetermined pressure angle with respect to the plane of said one of said side walls, an end face formed on said cutting end at a predetermined relief angle with respect to the plane of a

cross section of the blade, and a front face formed along the full length of said front wall of the blade at a predetermined rake angle with respect to said front wall, the intersection of

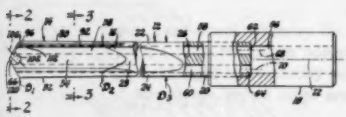
said side and front faces constituting a cutting edge, and said side face and said end face being the only surfaces requiring resharpening during the operational life of said blade.

4,137,002

HIGH SPEED COOLANT FEEDING GUN DRILL AND CUTTING HEAD SECTION THEREFOR

Edison D. Barker, Kettering, and John A. Cook, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 5, 1977, Ser. No. 857,525
Int. Cl.² B23B *27/10, 51/06*
U.S. Cl. 408—59 **3 Claims**



2. A gun drill cutting head section adapted to be mounted on and secured to a drill shank-carrying section to make a complete gun drill, said cutting head section comprising: an axially extending body having a cutting end and a mounting end, said body being defined by a web center section and a pair of diametrically opposed lands defining circumferentially therebetween a pair of axially parallel diametrically opposed flutes forming chip exit channels;

each of said lands having a leading margin and a trailing margin circumferentially separated by a relief surface of lesser cross section diameter than the cross section diameter of said margins, said leading margins each having a chip breaker undercut at the cutting end, said trailing margins being circumferentially spaced about 90° from said leading margins;

a coolant passage in each of said lands extending axially parallel to the axis of said cutting head section with one end opening through said cutting end and the other end opening through said mounting end, the axes of said coolant passages being located in a plane passing through the axis of said cutting head section and arcuately spaced about 45° from said leading and trailing margins;

each of said chip exit channels being defined by side surfaces of said lands and said web with all of said side surfaces from a trailing margin to a line location inwardly spaced from a leading margin being defined as arcuate sections of a cylinder subtending through an arc substantially more than 90° and on the order of 120°;

and relief means at the cutting end providing for flushing of drilled material generated during drill use.

4,137,003

DRILL JIG

Jules Budoff, 17 Garden Dr., Monticello, N.Y. 12701

Filed Oct. 7, 1977, Ser. No. 840,132
Int. Cl.² B23B *47/28, 49/00*
U.S. Cl. 408—103 **8 Claims**

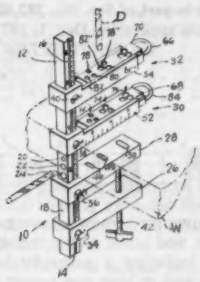
1. A drill jig, which comprises:

an elongated support member;

means connected transversely to said elongated support member for clamping a workpiece; and

first drill guide means adjustably mounted on and extending transversely from said support member and positioned in use adjacent said workpiece for permitting formation of a rectangular mortise therein;

said drill guide means comprising a channel-shaped member having at least one elongated through slot formed therein, and a drill guide plate slidably disposed within said channel-shaped member and including at least three substantially circular guide holes formed therethrough;



wherein said three guide holes formed in said guide plate are disposed in a triangular configuration and two of said three guide holes may be aligned over the respective ends of said elongated through slot in said channel-shaped member while the third of said three guide holes may be aligned over the middle of said elongated through slot in said channel-shaped guide member;

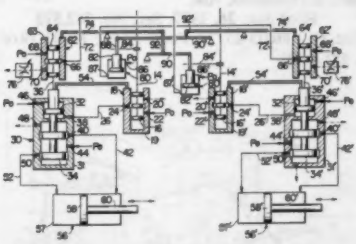
said elongated support member including at least one guide hole extending transversely therethrough for permitting formation of a pilot hole in said workpiece which is substantially perpendicular to said rectangular mortise.

4,137,004

OPERATION-CONTROL METHOD FOR HYDRAULIC MACHINE

Takao Kuwabara, and Hiroshi Okumura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 6, 1977, Ser. No. 794,550
Claims priority, application Japan, May 7, 1976, 51-52519
Int. Cl.² F01D *17/26*
U.S. Cl. 415—1 **10 Claims**



1. An operation-control method for hydraulic machines wherein two or more hydraulic machines are positioned in water conduits separated or branched upstream thereof, with branch water conduits downstream therefrom being joined together or maintained separate, so that said hydraulic machines are communicated with each other through said branch water conduits, said method comprising the steps of:

producing a transient operation signal correlated to a change in at least one operational condition of a hydraulic ma-

chine that will change the water conditions in the communicated water conduits; and

fixing a range of operational speed of guide vanes in another one of the hydraulic machines in response to said signal so as to override any control signal to the another hydraulic machine that would otherwise change the operational speed of its guide vanes outside of the fixed range.

4,137,005

OCEANIC WAVE POWERED PRIME MOVER

Walter F. Comstock, Shawnee Mission, Kans., assignor to Outdoor Enterprises of America, Inc., Shawnee Mission, Kans.

Continuation-in-part of Ser. No. 782,886, Mar. 30, 1977, abandoned. This application Dec. 1, 1977, Ser. No. 856,415

Int. Cl.² F01D *7/04*

U.S. Cl. 415—2 **13 Claims**

1. A prime mover for harnessing energy in surface waves on a body of water, said prime mover including:

drive means including a generally horizontally disposed drive shaft and at least one power rotor coaxially supported on the shaft;

stationary structure extending upwardly beyond the surface of said body;

mechanism shiftably mounting said drive means on said structure for up and down movement over said body;

said rotor having a central hub and a number of radially projecting wave-engageable blades secured to the hub for powered rotation by said waves;

a planetary gear assembly operably coupling said rotor and said shaft for in unison rotation,

said gear assembly including a speed multiplier for rotation of said shaft at a speed greater than said rotor,

lift means for selectively shifting said drive means toward and away from said surface whereby to permit positive optimum positioning of said rotor relative to said surface for advantageous wave engagement; and

a control for said drive means, there being a wave height sensor coupled with said control for shifting said drive means in response to changes in wave height.

4,137,006

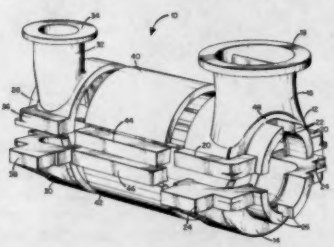
COMPOSITE HORIZONTALLY SPLIT CASING

John H. Becker, Mountain Brook, Ala., assignor to K B Southern, Inc., Birmingham, Ala.

Filed Jan. 26, 1977, Ser. No. 762,513

Int. Cl.² F01D *25/24;* F03B *11/02;* F04D *29/40*

U.S. Cl. 415—201 **2 Claims**



1. A composite horizontally split casing comprising: an inlet end having upper and lower seamless inlet end sections, one of which is provided with an integral inlet nozzle; an outlet end having upper and lower seamless outlet end sections, one of which is provided with an integral outlet nozzle; a generally cylindrical rigid shell fabricated separately from and extending axially between said inlet and outlet end sections, said shell being subdivided into upper and lower semi-cylindrical shell sections, said upper semi-cylindrical shell section permanently joined at opposite ends respectively to said upper inlet and outlet end sections to form an upper casing half, said lower semi-cylindrical shell section permanently joined at opposite ends respectively to said lower inlet and outlet end sections to form a lower casing half; external bolting flanges on said upper and lower casing halves, said bolting flanges having end segments which are formed integrally with said end sections and intermediate segments which are permanently joined to said shell sections; and means cooperating with said bolting flanges to removably mount said upper casing half on said lower casing half.

4,137,007

ROTOR BLADE STRUCTURE

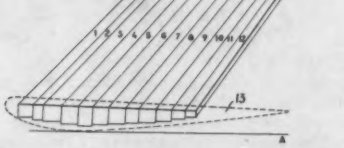
Walter Schönball, Thuringerstrasse 6, D53 Bonn, Germany

Filed Dec. 20, 1976, Ser. No. 752,323

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1975, 2558882

Int. Cl.² F03D *1/06*

U.S. Cl. 416—229 R **3 Claims**



1. A rotor blade for a wind generator, comprising;

a plurality of straight spars each having a longitudinally uniform, rectangular cross-section, and all secured to one another in lateral contact with one another to provide an integral unit thereof, similar to a plank;

a skin of synthetic plastic foam embedding the unit of spars and defining a rotor blade having an exterior, aerodynamic profile, the number of the spars, transverse of the rotor blade, diminishing longitudinally from a hub end of the rotor blade, and the uniform cross-section of each spar having an area corresponding to the cross-sectional area of a directly embedding portion of the rotor blade; and

means for attaching the hub end of the rotor blade to a hub, whereby the rotor blade has maximum strength near the hub.

4,137,008

ADJUSTABLE BLOWING SLOT FOR CIRCULATION CONTROL AIRFOIL

James B. Grant, Windsor, Conn., and George A. McCoubrey, Westfield, Mass., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 21, 1977, Ser. No. 835,125

Int. Cl.² B64C *21/08*

U.S. Cl. 416—20 R **3 Claims**

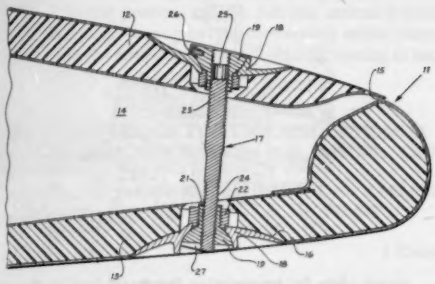
1. A circulation control airfoil comprising,

an upper duct panel and a lower duct panel spaced apart to form an edge slot, each said duct panel having a plurality of dimples therein,

a plurality of saddles attached one each in each said dimple,

a plurality of threaded fasteners positioned in each said saddle, and

a plurality of struts each having a first threaded end of a first pitch threadedly attached to a fastener in said upper duct panel and each having a seconded threaded end of a pitch different from said first pitch threadedly attached to a



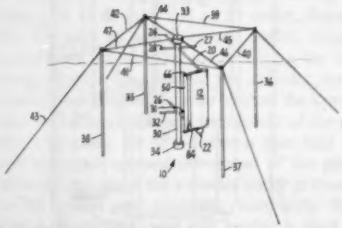
fastener in said lower duct panel whereby the different thread pitches provide a high resolution adjustment for maintaining the edge slot height and whereby said saddles transfer the load of said struts over a large area of said duct panels.

4,137,009

PIVOTED BLADE BARREL ROTOR WIND TURBINE

James W. Telford, Reno, Nev., assignor to Board of Regents University of Nevada System, Reno, Nev.

Filed Nov. 5, 1976, Ser. No. 739,125
Int. Cl.² F03D *3/00*
U.S. Cl. 416—24 **42 Claims**



1. A wind turbine, comprising:

airfoil means for deriving lift from wind moving therepast;

support arm means for supporting said airfoil means for rotation about the axis of the wind turbine;

airfoil pivot means for permitting said airfoil means to pivot with respect to said support arm means in response to said wind;

aerodynamic airfoil orienting means for aerodynamically orienting associated ones of said airfoil means with respect to said wind; and

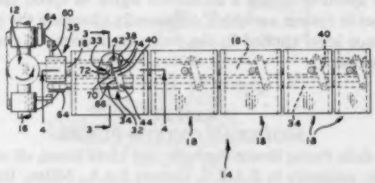
deflecting means for alternately deflecting said airfoil orienting means to one side of the chords of their associated airfoil means and then to the other and causing said airfoil orienting means to dwell on both sides of the chords of their associated airfoil means.

4,137,010

CONSTANT LIFT ROTOR FOR A HEAVIER THAN AIR CRAFT

Robert H. Stroub, San Jose, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jul. 25, 1977, Ser. No. 818,916
Int. Cl.² B64C *27/72*
U.S. Cl. 416—51 **10 Claims**



1. In a constant lift rotor, the improvement comprising:

A. a spar for an airfoil radially extended from a rotor hub adapted to drive the spar in angular displacement along a concentrically related path;

B. an elongated airfoil mounted on said spar and supported thereby for pitch displacement about the longitudinal axis thereof, said airfoil having an aerodynamic center spaced in trailing relation with said spar, said angular displacement of said spar and said airfoil causing a lift force on said airfoil and a pitch moment about said spar axis;

C. a motion limiting arm pivotally coupled to said spar and having a camming surface extended along one edge extended along one edge thereof;

D. a movable cam follower truck connected to said airfoil, said truck being seated on said camming surface and movable therealong in response to centrifugal forces for establishing a pitch moment acting in opposition to said pitch moment; and

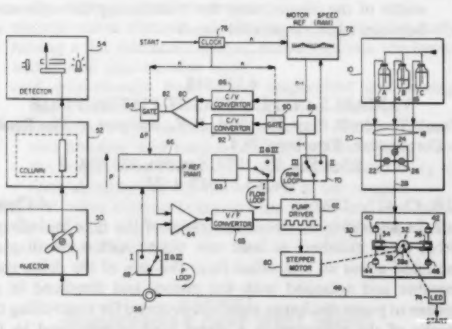
E. means coupled to said motion limiting arm for modulating said pitch control moment.

4,137,011

FLOW CONTROL SYSTEM FOR LIQUID CHROMATOGRAPHS

John V. Rock, Los Altos, Calif., assignor to Spectra-Physics, Inc., Mountain View, Calif.

Filed Jun. 14, 1977, Ser. No. 806,591
Int. Cl.² F04B *49/08*
U.S. Cl. 417—22 **6 Claims**



1. In a liquid chromatograph system having a motor driven pump for supplying a carrier containing isocratic or gradient controlled elution solvents and for delivering the carrier to an LC column under pressure, a method of flow control of the

pump output comprising the steps of measuring pump output pressure over at least one cycle of pump operation at constant pump motor speed to develop a pressure reference level for a given carrier; subsequently varying the speed drive of the pump motor to maintain the output pressure equal to the pressure reference level; measuring the pattern of pump motor speed during a cycle of operation; storing said pattern in a memory to provide a pump motor speed reference, measuring the actual pump motor speed during operation of the system; comparing the pump motor speed reference and actual pump motor speed to obtain a difference signal in speed caused by changes in system variables; continually changing the pressure reference level applied to the pump in response to the difference signal.

4,137,012

MODULAR GETTER PUMPS

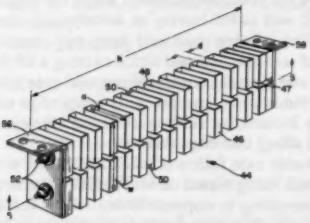
Paolo della Porta; Bruno Ferrario, and Livio Rosai, all of Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Oct. 7, 1977, Ser. No. 840,243

Claims priority, application Italy, Nov. 3, 1976, 29004 A/76; Mar. 9, 1977, 21075 A/77

Int. Cl.[2] F04B *37/02*

U.S. Cl. 417—51 **22 Claims**



1. A modular getter pump comprising:

(1) a first and a second supporting electrode,

(b) at least one strip of high ohmic resistance material connected to and supported by the first and second supporting electrodes, the strip having a length much greater than its width and a nominal thickness, the strip being pleated into flat substantially parallel zones which are uniformly separated from each other thereby reducing the effective length of the strip, the pleated strip forming a substrate having a non-evaporable getter material at least partially embedded therein, and

(c) rod means orthogonally positioned with respect to the width of the pleated strip for maintaining the separation between adjacent parallel zones.

4,137,013

VARIABLE DISPLACEMENT PISTON PUMP

Frank Woodruff, New Hartford, N.Y., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Sep. 22, 1977, Ser. No. 835,623

Int. Cl.[2] F04B *1/28*

U.S. Cl. 417—222 **6 Claims**

1. In a variable displacement pump of the type including a drive shaft member, at least one piston and a swash plate mounted about an axis offset from the axis of the drive shaft member and arranged with the piston, and displaced in response to pump discharge manifold pressure for controlling the stroke of the piston upon a thrust load proportional to the discharge manifold pressure being transmitted to the swash plate, means for transmitting the thrust load comprising:

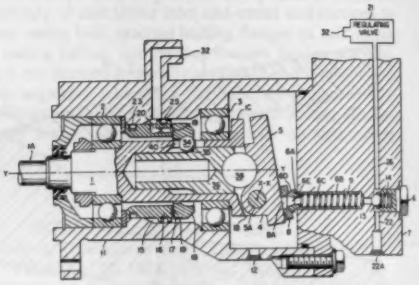
a pump casing containing a fluid;

a differential area piston slidingly arranged within the casing and cooperating therewith to form a chamber for receiving a pressure proportional to the pump discharge pressure;

the differential area piston having a face which forms a hydrostatic thrust bearing;

means for metering the fluid to the hydrostatic thrust bearing; and

means coupled to the hydrostatic thrust bearing and to the



swash plate for transmitting the thrust load to the swash plate upon the chamber receiving the pressure proportional to the pump discharge pressure including a ring member adjacent the hydrostatic thrust bearing and displaced in response to the thrust load provided thereby, and means arranged with the ring member and the swash plate and responsive to the displacement of the ring member for transmitting the displacement to the swash plate.

4,137,014

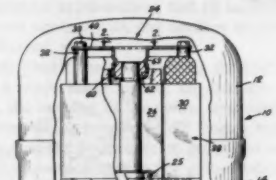
TWO SPEED COMPRESSOR WITH ROTOR SUPPORT STRUCTURE

Sidney A. Parker, Ft. Worth, Tex., assignor to Lennox Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 601,471, Aug. 4, 1975, abandoned. This application Jun. 15, 1977, Ser. No. 806,604

Int. Cl.[2] F04B *17/00, 35/04*

U.S. Cl. 417—326 **5 Claims**



1. In a refrigerant compressor, the combination of a housing, compression mechanism resiliently supported in said housing, said compression mechanism including cylinder means, piston means in said cylinder means, a drive shaft for actuating said piston means, a multi-speed motor including a stator and a rotor electrically coupled thereto, said rotor being connected to said drive shaft for rotating the drive shaft, bearing means for journalling the drive shaft, including a first bearing at an end of the drive shaft and a second bearing intermediate the ends of the drive shaft and vibration dampening means on the side of the motor opposite the second intermediate bearing for engaging the drive shaft and preventing undesirable vibration thereof that could cause rubbing between the stator and the

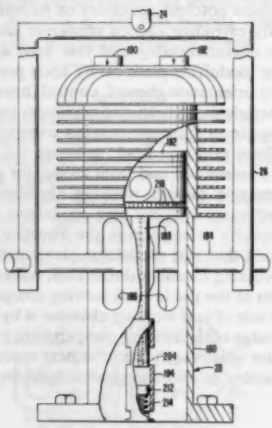
rotor during operation of the motor, said vibration dampening means comprising a self-aligning bearing engaging an end of the drive shaft and a plate member having a bell-like central portion, said plate member being secured at the upper end of the stator, with the bell-like central portion receiving said self-aligning bearing that engages with the end of the drive shaft to prevent undesirable vibration thereof and thereby prevent rubbing between the stator and the rotor secured to the drive shaft, the self-aligning bearing being affixed within the bell-like central portion, and the bell-like central portion and the self-aligning bearing having cooperating means therebetween to prevent rotation of the self-aligning bearing in use.

4,137,015

ENERGY CONVERSION SYSTEM USING WINDMILL

William C. Grossman, 4274 Briarwood Way, Palo Alto, Calif. 94303

Division of Ser. No. 644,495, Dec. 29, 1975, Pat. No. 4,055,950. This application May 4, 1977, Ser. No. 793,807
Int. Cl.[2] F04B *39/02*
U.S. Cl. 417—366 **1 Claim**



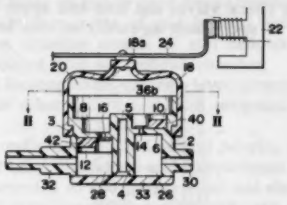
1. An air compressor comprising: a cylinder having an upper end provided with an air inlet and an air outlet, there being a check valve for each of said inlet and outlet, respectively; means coupled with the cylinder for mounting the same in a fixed position; a piston mounted in the cylinder for up and down movement therein and operable to close the lower end of said cylinder, whereby downward movement of the piston in the cylinder will cause air to be drawn into said cylinder through said inlet and upward movement of the piston will cause air to be forced out of the cylinder under pressure; a rod secured to the piston and extending outwardly therefrom exteriorly of said cylinder, said rod having a fluid passage therethrough, said piston having a number of fluid-receiving channels communicating with said passage in the rod and terminating at the outer periphery of the piston; a check valve in the lower end of said rod; a tubular mount near the lower end of the rod; a reservoir for a flowable lubricant in fluid communication with said mount; a second piston biased upwardly and disposed in the lower part of said mount, said rod being movable downwardly into said lower part to trap lubricant therein, said second piston being operable to open the check valve in the rod and to force the trapped lubricant into said fluid passage in response to the downward movement of the rod, said check valve in the rod being biased into a closed position and movable into said closed position when the rod is moved upwardly; and a member coupled with said rod for moving the same up and down.

4,137,016

VALVE MECHANISM FOR AN AIR PUMP

Tsuyoshi Itakura, Tokyo, Japan, assignor to Itakura Soki Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1977, Ser. No. 821,817
Claims priority, application Japan, Jan. 24, 1977, 52-7174[U]
Int. Cl.[2] F04B *43/04, 39/10*
U.S. Cl. 417—413 **4 Claims**



1. A valve mechanism for an air pump comprising:
a cylindrical casing which has a first valve housing having a bed and a second valve housing having a bed;
said first and second housings having semi-circular walls and opposed protrusions at the termination of said semi-circular walls,
said first and second housings having holes at the beds thereof,
a cup-like membrane of resilient materials;
the open end of said membrane being connected to said cylindrical casing to form a chamber at one end of said casing,
the closed end of said membrane being connected to a vibration device,
a cover member fixed to the other end of said casing;
a first chamber connected to the hole of said first housing and
a second chamber connected to the hole of said second housing;
an inlet nozzle connected to said first chamber and an outlet nozzle connected to said second chamber;
a first valve element which has a semi-circular body having a flat side and a tongue extending from the lower end of said semi-circular body;
said semi-circular body being trapezoidal and having upper diameter greater than the lower diameter, said first valve element being secured within said first housing,
said tongue having a width smaller than the length of said flat side of said semi-circular body to form shoulders at the starting end of the tongue,
a second valve element which has a semi-circular body having a flat side and a tongue extending from the lower end of said semi-circular body;
said semi-circular body being trapezoidal and having upper diameter greater than the lower diameter,
said second valve element being secured within said second housing, said tongue having a width smaller than the length of said flat side of said semi-circular body to form shoulders at the starting end of the tongue,
said first valve element being secured within said first housing and said second valve element being secured within said second housing.

4,137,017

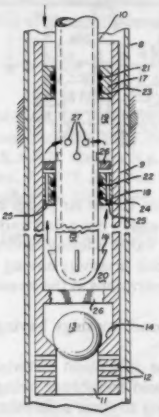
SUBMERSIBLE DEEP WELL PUMP

Vincent P. Lonardo, 5890 Salt Springs Rd., Girard, Ohio 44420

Filed Jul. 1, 1977, Ser. No. 812,320
Int. Cl.[2] F04B *47/00, 21/04*
U.S. Cl. 417—431 **2 Claims**

1. A submersible deep well pump comprising a vertically disposed cylinder open at its upper and lower ends, vertically

spaced apertured means in said cylinder defining upper and lower chambers, upwardly opening check valves in two of said chamber defining means, a hollow piston positioned in said cylinder and slidably engaged in two of said apertured chamber defining means so as to be movable partially into and out of the lower one of said chambers, said hollow piston having apertures therein communicating with the upper one of said chambers whereby movement of said piston downwardly into said lower chamber displaces fluid therein upwardly through one of said check valves and into said upper chamber and movement of said piston upwardly in said lower chamber



moves fluid into said lower chamber upwardly through the other one of said check valves, said vertical spaced apertured means comprising an area of reduced diameter at the lower end of said cylinder and forming a seat for one of said check valves and a pair of annular members, one positioned adjacent said upper end of said cylinder and the other positioned inwardly of the ends of said cylinder, a check ring valve on said other annular member arranged to close bores therethrough, sidewardly extending projections formed adjacent the lower end of said hollow piston so as to engage said other annular member and prevent said hollow piston from moving through the same.

4,137,018

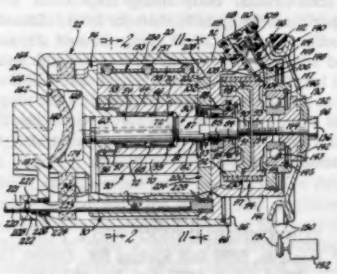
ROTARY VANE VARIABLE CAPACITY COMPRESSOR

Byron L. Brucken, Miamisburg, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 7, 1977, Ser. No. 849,032

Int. Cl.[2] F04B *41/00, 49/02;* F01C *21/14;* F04C *17/00*

U.S. Cl. 417—440 **1 Claim**



1. A rotary variable capacity refrigerant compressor comprising a shell-like housing closed at one end, a bored cylinder having front and rear heads fixed at each end to define a cylindrical working chamber, said cylinder telescoped within said housing such that said front cylinder head is in sealed relation with the open end of said housing, a rear rotor stub shaft fixed to and extending into said working chamber from said rear head on an axis eccentric to the axis of said chamber, a rotor tube journaled on said rear stub shaft for rotation about said eccentric axis within said chamber, said rotor tube having a plurality of slots therein, slidable vanes mounted in said slots engaging the wall of said working chamber separating said chamber into a plurality of moving compartments, discharge port means communicating with said working chamber adjacent its throat area, a front driven shaft coaxial with said rear stub shaft, said front driven shaft journaled in said front head with its inner end fixed to said rotor tube and its outer front end connected to drive means, a suction enclosure in said rear head communicating with suction inlet means in said housing closed-end, rear suction gas intake aperture means formed in said rear head communicating between said suction enclosure and the moving compartments on the expansion side of said working chamber, a circular recess formed in the inner face of said front head concentric with said cylinder working chamber, a capacity modulator plate rotatively mounted in said recess having a portion of its peripheral edge formed with an elongated arcuate notched-out cavity on its rearwardly facing surface, axially extending suction crossover passage means in said cylinder interconnecting said rear head aperture means and said front modulator plate cavity upon preselected maximum capacity orientation thereof, control means operative to rotate said modulator plate to said maximum capacity orientation, whereby the compressor moving compartments are fed suction gas from said rear head enclosure via both said rear head aperture means and said front modulator plate cavity on the expansion side of said working chamber, said control means operative for rotating said modulator plate from its maximum capacity orientation in the direction of rotation of said vanes such that said modulator plate cavity is advanced toward the working chamber throat area, whereby a predetermined portion of the gas in each moving compartment on the compression side of said working chamber is by-passed around the forward edge of the moving compartment trailing vane via said modulator plate cavity into the next successive working chamber resulting in said compressor operating at a reduced capacity.

4,137,019

ROTARY PISTON MACHINE

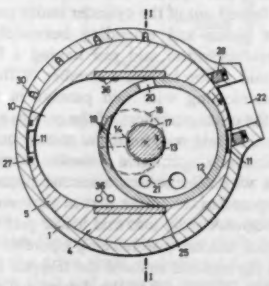
Rudolf Hofmann, c/o Sullair Europe Corp., Wallensteinstrasse 20, 8192 Geretsried, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 766,383

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1976, 2604665

Int. Cl.[2] F04B *19/02;* F01C *7/00, 19/00, 21/02*

U.S. Cl. 417—462 **4 Claims**



1. A rotary piston machine including a housing having an inlet and at least one outlet and being formed by an annular jacket portion and a pair of lateral plate portions one on each

side of said jacket portion, said jacket portion defining a circular inner circumference, a rotor within the housing and being formed by an annular center portion and a pair of lateral end portions one on each side of said center portion, said center portion having a circular outer circumference corresponding to the inner circumference of the housing and a diametrically extending recess acting as a working chamber with openings at each of the diametrically opposed ends of the recess communicating exteriorly of the rotor, said rotor being adapted to rotate within the housing to move said openings into and out of communication with said outlet, a rotary piston positioned within said recess and adapted to reciprocate between the ends of said recess, and a shaft having a rotational axis eccentric of the rotational axis of the rotor to which the rotary piston is secured, wherein the improvement comprises:

a pair of first bearing means one at each side of said rotor for mounting the rotor for rotation within said housing;

a pair of second bearing means one at each side of said rotary piston for mounting the shaft and the rotary piston for rotation within the housing;

first spring means for biasing the first bearing means toward one side of the housing and resiliently locating said first bearing means; and

second spring means for biasing the second bearing means in the same direction as said first bearing means and resiliently locating said second bearing means.

4,137,020

DIAPHRAGM TYPE AIR PUMP

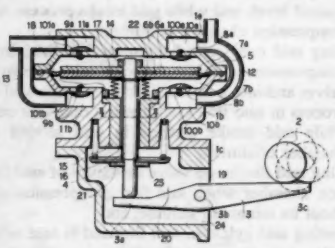
Mikiji Ito, Nagoya; Naohiro Naganuma, and Shojiro Nagano, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Dec. 22, 1977, Ser. No. 863,580

Claims priority, application Japan, Dec. 26, 1976, 51-174666[U]; Feb. 4, 1977, 52-12847[U]

Int. Cl.[2] F04B *45/04;* F16J *15/00*

U.S. Cl. 417—534 **3 Claims**



1. A diaphragm type air pump comprising:

first and second housing means;

a diaphragm interposed between said first and second housing means to respectively form first and second diaphragm chambers at both sides thereof;

first and second inlet openings respectively formed on said first and second housing means for operatively communicating said diaphragm chambers with the outside thereof;

first and second outlet openings respectively formed on said first and second housing means for operatively communicating said diaphragm chambers with an outlet pipe of the air pump;

first and second inlet valve members respectively associated with said first and second openings for opening and closing the same in accordance with expansion and contraction of said diaphragm chambers;

first and second outlet valve members respectively associated with said first and second outlet openings for opening and closing the same in accordance with expansion and contraction of said diaphragm chambers;

a shaft connected at one end to said diaphragm and extending through said second diaphragm chamber;

a bushing fixed to said second housing means and having a hole through which said shaft extends, an axially extending groove being formed on one of the inner surface of said hole and the outer surface of said shaft;

a bellows disposed in said second diaphragm chamber and surrounding a portion of said shaft, one end of said bellows being air-tightly fixed to said diaphragm and the other end being air-tightly fixed to said bushing to form a bellows chamber inside of said bellows, whereby said diaphragm chamber outside of said bellows being air-tightly isolated from said bellows chamber;

said second housing means having a lever compartment into which the other end of said shaft protrudes from said bushing;

a lever pivotally fixed to said second housing means, the inner end being disposed in said compartment and operatively connected to said other end of said shaft, and the outer end of said lever being operatively connected to an eccentric cam formed on a crankshaft of said engine, whereby said lever is driven by said eccentric cam to perform a pivotal movement,

said pivotal movement of said lever being transmitted to said diaphragm through said shaft so that said diaphragm is reciprocally moved in said diaphragm chambers, and thereby said diaphragm chambers are respectively expanded and contracted in accordance with the reciprocal movement of said diaphragm for alternately drawing air thereinto through the respective inlet openings and forcing out the drawn air therefrom through the respective outlet openings.

4,137,021

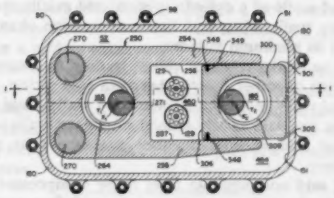
ROTARY COMPRESSOR AND PROCESS OF COMPRESSING COMPRESSIBLE FLUIDS

Marek J. Lassota, 8657 W. Foster Ave., Apt. 1B, Chicago, Ill. 60656

Continuation-in-part of Ser. No. 659,324, Feb. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 610,159, Sep. 4, 1975, Pat. No. 4,010,675, which is a continuation of Ser. No. 523,958, Nov. 14, 1975, abandoned. This application Jul. 27, 1977, Ser. No. 819,552

Int. Cl.[2] F01C *1/24, 21/08;* F04C *17/16;* F16J *1/24*

U.S. Cl. 418—1 **16 Claims**



2. A rotary compressor comprising:

a cylinder-piston comprising a body and spaced arms extending from one end of said body, said spaced arms having opposing parallel surfaces and forming with said body of said cylinder-piston a U-shaped opening;

said cylinder-piston further having two side faces;

a piston positioned within said U-shaped opening of said cylinder-piston and having spaced faces adjoining said opposing parallel surfaces of said spaced arms of said cylinder-piston;

said piston further having two spaced side faces;

two axially spaced walls adjoining said side faces of said cylinder-piston and said spaced side faces of said piston;

a rotatable cylinder-piston shaft comprising an eccentric portion journaled in said body of said cylinder-piston;

a rotatable piston shaft comprising an eccentric portion journaled in said piston;

gearing means interconnecting said cylinder-piston shaft and said piston shaft so said shafts follow coordinated rotations in opposite directions and said cylinder-piston and said piston follow coordinated planetary rotations in opposite directions with and around said eccentric portions of said shafts;

said cylinder-piston and said piston forming moveable surfaces, and said axially spaced walls forming stationary surfaces of a compression chamber located between said body of said cylinder-piston and said piston and varying in volume upon said coordinated planetary rotations in opposite directions of said cylinder-piston and said piston;

intake means comprising an intake valve leading to said compression chamber; and

discharge means leading from said compression chamber.

4,137,022

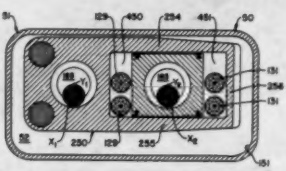
ROTARY COMPRESSOR AND PROCESS OF COMPRESSING COMPRESSIBLE FLUIDS

Marek J. Lassota, 8657 W. Foster Ave., Apt. 1B, Chicago, Ill. 60656

Continuation-in-part of Ser. No. 692,129, Jun. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 659,324, Feb. 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 610,159, Sep. 4, 1975, Pat. No. 4,010,675, which is a continuation of Ser. No. 523,958, Nov. 14, 1974, abandoned. This application Aug. 11, 1977, Ser. No. 823,656

Int. Cl.[2] F01C *1/24, 21/08;* F04C *17/16;* F16J *1/24*

U.S. Cl. 418—1 **31 Claims**



1. A compressible fluid compressing process comprising sequentially the steps of:

opening an intake valve or valves leading into a first compression chamber located between a piston, a body and spaced walls of a cylinder-piston, and axially spaced stationary walls when said first compression chamber is at about its minimum volume;

closing an intake valve or valves leading to a second compression chamber located between said piston, said two spaced walls and an interconnecting wall of said cylinder-piston, and said axially spaced stationary walls when said second compression chamber is at about its maximum volume;

passing said compressible fluid to be compressed through said intake valve or valves into said first compression chamber while:

said volume of said first compression chamber increases as a result of a coordinated and opposite planetary rotations of said piston and said cylinder-piston with a distance between said piston and said body of said cylinder-piston increasing; and

a discharge valve or valves of said first compression chamber are closed;

compressing said compressible fluid in said second compression chamber by decreasing said volume of said second compression chamber as a result of said coordinated and opposite planetary rotations of said piston and said cylinder-piston while a distance between said piston and said wall interconnecting said two spaced walls of said cylinder-piston decreases;

opening a discharge valve or valves of said second compression chamber when the pressure of said compressible fluid compressed in said second compression chamber reaches desired level, while continuing said intake process in said first compression chamber;

passing said compressed compressible fluid from said second compression chamber through said discharge valve or valves and into a suitable receiver while said compression process in said second compression chamber continues, and while continuing said intake process in said first compression chamber;

closing said intake valve or valves of said first compression chamber when said first compression chamber is at about its maximum volume;

closing said discharge valve or valves of said second compression chamber when said second compression chamber is at about its minimum volume;

opening said intake valve or valves leading into said second compression chamber when said second compression chamber is at about its minimum volume;

compressing said compressible fluid in said first compression chamber by decreasing said volume of said first compression chamber as a result of said coordinated and opposite planetary rotations of said piston and said cylinder-piston while said distance between said piston and said body of said cylinder-piston decreases;

passing said compressible fluid to be compressed through said intake valve or valves into said second compression chamber while:

said volume of said second compression chamber increases as a result of said coordinated and opposite planetary rotations of said piston and said cylinder-piston with said distance between said piston and said wall interconnecting said two spaced walls of said cylinder-piston increasing; and

said discharge valve or valves of said second compression chamber are closed;

opening said discharge valve or valves of said first compression chamber when the pressure of said compressible fluid compressed in said first compression chamber reaches desired level, and while said intake process in said second compression chamber continues;

passing said compressed compressible fluid from said first compression chamber through said discharge valve or valves and into a suitable receiver while said compression process in said first compression chamber continues, and while said intake process in said second compression chamber continues;

closing said discharge valve or valves of said first compression chamber when said first compression chamber is at about its minimum volume; and

repeating said cylcle in said first and in said second variable volume compression chambers.

4,137,023

LOW ENERGY RECOVERY COMPOUNDING AND FABRICATING APPARATUS FOR PLASTIC MATERIALS

Isaac Moked, New Brunswick; Richard H. Handwerk, Somerville, and Walter R. Marshall, Bloomfield, all of N.J., assignors to Union Carbide Corporation, New York, N.Y.

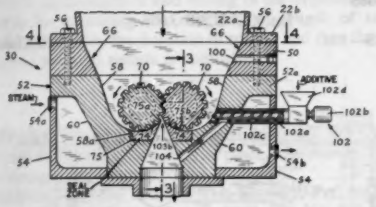
Continuation-in-part of Ser. No. 609,947, Sep. 3, 1975, Pat. No. 4,032,391. This application Mar. 31, 1977, Ser. No. 783,438

Int. Cl.[2] F04C *1/10, 15/00;* F01C *21/10;* B29F *3/00*

U.S. Cl. 418—15 **24 Claims**

1. A gear pump for pumping highly viscous media comprising: housing means defining an inlet passage at one end, an outlet passage at an opposite end and a chamber therebetween; a pair of pump gears generally horizontally positioned within said chamber having intermeshing teeth and being rotatably mounted in said housing, said chamber and said pump gears defining therebetween a media free space; said chamber and each of said gears defining gear sealing zones adjacent said outlet passage, each sealing zone having a minimum length equal to the circumferential distance between two adjacent

gear teeth across the full axial length of the gears at the outside diameter of said gears; said media free space expanding from the end of said seal zones remote from said outlet passage such that an increasing hydraulic radius is produced at least to the plane of the tops of said gears, said increasing hydraulic radius being produced by an increasing horizontal dimension of the chamber from the end of said seal zones remote from said



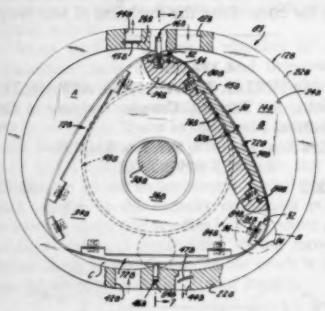
outlet passage to the plane of the tops of said gears, whereby a pressure gradient is created to fill the gear cavities with said viscous media; said outlet passage adjacent said sealing zones having a cross-sectional area of from 0.2 to 2.0 times the product of the gear width and the gear tooth height; and said chamber increasing in cross-sectional area above the tops of said gears to the top of said chamber, thereby enhancing the pumping capacity and volumetric efficiency of said gear pump.

4,137,024

ROTOR FOR ROTARY PISTON MECHANISM

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Jul. 18, 1977, Ser. No. 816,436
Int. Cl.[2] F01C *1/02, 5/02, 5/06, 19/06*
U.S. Cl. 418—61 A **5 Claims**



1. In a rotary piston mechanism of the type comprising a housing with axially-spaced end walls and a peripheral wall interconnecting the end walls to form a multi-lobed cavity therebetween, a rotor mounted within said cavity for rotation on an axis eccentric to the housing cavity axis, the rotor having opposite end faces adjacent the housing end walls and a peripheral surface of a contour which substantially coincides with the trace of the inner envelope of a hypotrochoid, the rotor defining with the housing walls a plurality of working chambers which vary in volumetric size as the rotor rotates relative to the housing and intake and exhaust ports for passing fluid into and from the working chambers as the latter change in volumetric size, the improvement in the rotor comprising:

(a) an endless flexible band overlying the peripheral surface of the rotor and extending substantially the full distance between the opposite end faces of said rotor; and

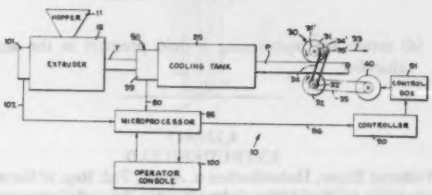
(b) tensioning means carried by the rotor to resiliently bias said endless flexible band in a direction radially outwardly of the rotor axis of rotation to a point beyond the trace of the rotor peripheral surface in positions of the tensioning means away from the junctures of the cavity lobes.

4,137,025

APPARATUS FOR MEASURING AND CONTROLLING THE WALL THICKNESS OF PLASTIC PIPES

Kenneth E. Graves, 18701 Harleigh Dr., Saratoga, Calif. 95070, and Peter Angelbeck, 555 Middlefield Rd., Mountain View, Calif. 94040

Filed Mar. 7, 1977, Ser. No. 775,246
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—71 **16 Claims**



1. Apparatus for producing plastic pipe comprising:

(a) an extruder for forming a hollow plastic tube in a molten state;

(b) a sizing sleeve disposed downstream of said extruder for receiving the hollow plastic tube in a molten state formed by said extruder to form a plastic pipe in a molten state;

(c) takeaway means for removing the plastic pipe in a molten state from said sizing sleeve for advancement along a predetermined path downstream of the sizing sleeve;

(d) cooling means disposed along said predetermined path for forming a plastic pipe in a solid state from said plastic pipe in a molten state;

(e) measuring means disposed at the upstream end of said sizing sleeve said measuring means comprising a measuring sleeve through which said hollow pipe in a molten state advances, the axis of said measuring sleeve being coincident with the axis of said sizing sleeve, said measuring means further comprising a sonic transducer disposed adjacent to the outer wall of said measuring sleeve for transmitting sound pulses through said measuring sleeve and for detecting sound pulses reflected from the outer diameter of said plastic pipe in a molten state and from the inner diameter of said plastic pipe in a molten state to emit signals representative of the wall thickness of said plastic pipe in a molten state; and

(f) control means responsive to said signals emitted by said measuring means for controlling the operation of said takeaway means to adjust the speed at which said takeeaway means removes plastic in a molten state from said sizing sleeve for forming a plastic pipe of a prescribed wall thickness.

4,137,026

BRICKMAKING PRESS

Rudolf Gerstl, Vienna, Austria, assignor to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna and Oesterreichisch-Amerikanische Magnesit Aktiengesellschaft, Radenthein, both of, Austria

Filed Jul. 27, 1977, Ser. No. 819,567
Int. Cl.[2] B22F *3/04;* **B29B** *5/02*
U.S. Cl. 425—78 **5 Claims**

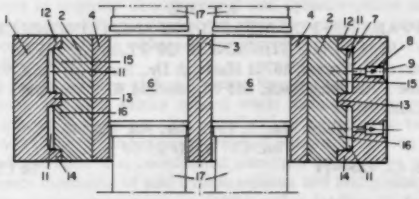
1. In a brickmaking press for making bricks, which comprises

(a) a segmental ring defining a mold cavity,

(b) a brick shaping mold supported by the segmental ring in the mold cavity, and

(c) a clamping ring surrounding and enclosing the segmental ring,

(l) the clamping and segmental rings defining an annular chamber therebetween; and



(d) means for maintaining a fluid pressure in the annular chamber.

4,137,027

EXTRUDERHEAD

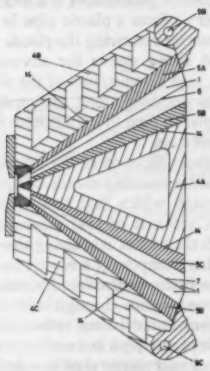
Wolfgand Rüger, Hohenbuchen u. Alfeld, Fed. Rep. of Germany, assignor to Karl-Heinz Schmidt, Fed. Rep. of Germany

Filed May 18, 1977, Ser. No. 798,082

Claims priority, application Fed. Rep. of Germany, May 18, 1976, 2622011

Int. Cl.² B29F *3/04*

U.S. Cl. 425—133.5 **9 Claims**



1. Extruder apparatus comprising an extruderhead having an inlet and an outlet and two screw extruders which converge at an acute angle to one another to feed material from both of said extruders to said head, said extruderhead comprising three parts, namely a wedge-shaped middle part which is fixed to said extruders and two outer parts which are disposed on opposite sides of said middle part and are hinged for movement between an open position and a closed position, said middle part having opposite outer faces which converge at an acute angle toward the outlet of said extruderhead and said outer parts having inner faces which face and are spaced from said opposite faces of said middle part, and insert plates removably mounted on and substantially covering said inner faces of said outer extruderhead parts and having channels on inner faces of said insert plates which define passages for extrusion of composite products of predetermined cross section formed partly of material from one of said extruders and partly of material from the other of said extruders when said hinged parts are in closed position, said insert plates being accessible for cleaning and for replacement when said hinged parts are in open position, and means operatively associated with said insert plates for positioning said insert plates on said outer extruderhead parts and for securing them removably in place on said outer extruderhead parts.

4,137,028

APPARATUS FOR THE EXTRUSION OF TUBULAR BODIES OF SYNTHETIC-RESIN MATERIAL

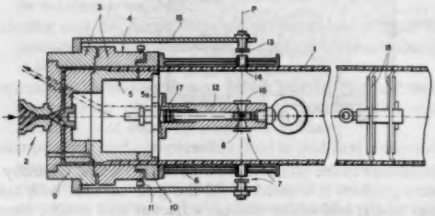
Paul Reitemeyer, Troisdorf-Bergheim, and Franz J. Kupper, Bensberg, both of Germany, assignors to Reifenhäuser KG, Troisdorf, Germany

Filed Jan. 24, 1978, Ser. No. 871,993

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1977, 2706085

Int. Cl.² B29F *3/04*

U.S. Cl. 425—141 **10 Claims**



1. An apparatus for the extrusion of tubular bodies, comprising an extrusion press having an outlet;

a tube-forming die connected to said outlet and receiving thermoplastified material therefrom, the tubular body emerging from said die, said die having an inner member and an outer member shiftable relative to said inner member, said material being extruded between said members;

a calibration sleeve connected to and extending axially from said die for imparting a given outer dimension to said body;

a radiation source mounted on said inner member within said sleeve; and

a plurality of radiation detectors mounted on said die and radially aligned with said radiation source, said radiation source and said detector constituting a thickness-measuring device for controlling the thickness of said body.

4,137,029

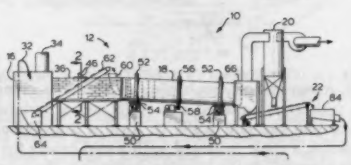
ORGANIC MATERIAL TREATMENT APPARATUS

Alfred W. Brooks, St. Thomas, Canada, assignor to Cannon Limited, Hamilton, Bermuda

Filed Sep. 19, 1977, Ser. No. 834,735

Int. Cl.² B29B *1/02*

U.S. Cl. 425—222 **21 Claims**



1. Apparatus for drying and pelletizing organic material such as sewage, the apparatus comprising: an elongate, rotatable, louvred drying drum, having longitudinal, circumferentially spaced-apart, radially inwardly disposed louvres; the drying drum including an input section, an output section and a central pelletizing section formed by adjacent portions of the input and output sections; the input section being adapted to be connected to a supply of heated air at a temperature between 500 and 800° F.; the output section adapted to be connected to a supply of cooling air; means for feeding organic material into the input section; means for rotating the louvred drying drum; means for passing said heated air and cooling air through the

louvres in the respective input and output sections to dry and cool the organic material; means for moving the organic material through the drying drum from the input to the output sections; an adjustable baffle located in the pelletizing section for blocking the airflow through the louvres in said pelletizing section; said baffle defining a continuous cylindrical rolling surface for rolling the organic material to form pellets; means for adjusting the longitudinal location of said rolling surface to control the location of said rolling of the organic material; and means for adjusting the longitudinal length of said rolling surface, whereby the duration of rolling and thus the size of the organic material pellets is controlled.

4,137,030

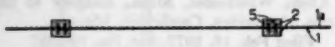
APPARATUS FOR THE MANUFACTURE OF CUSHIONS

Joseph F. Sanson, Beaugency, France, assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 540,555, Jan. 13, 1975, Pat. No. 4,046,611. This application Jun. 9, 1977, Ser. No. 804,871

Int. Cl.[2] B29C *17/04*

U.S. Cl. 425—388 **6 Claims**



1. Apparatus for integrating a cover cloth with moulded foamed plastics material in a vacuum mold in the manufacture of a resilient cushion, said means comprising

a pair of superimposed open-center frames, partable in the plane of the frame to receive a cover cloth between them, and means holding said frames together in clamping relation to said cover cloth to restrain lateral movement thereof, said frames having front and back portions corresponding respectively to the front and back edges of a cushion to be moulded and side portions joining said front and back portions and corresponding to the side edges of the cushion, said frames being mountable on the mouth of a vacuum mould to dispose said cover cloth across said mould mouth;

said frame portions having a plurality of slots arranged circumferentially thereabout and oriented substantially radially such that projections of the slot axes all intersect at a common point constituting a center of homothety in the plane of the frame in the open center thereof;

a guide member associated with and parallel to each of said slots and a needle supported in each slot by said guide member to permit its movement therealong, means urging said needles to the radially outermost position in their respective slots, said needles having points projecting into contact with and controlling sliding movement of said cover cloth in said frames as the cloth is drawn into the mould when vacuum is applied thereto.

4,137,031

METHOD AND APPARATUS FOR MAKING PLASTIC ARTICLES

Andrew C. Dickson, and Robert F. Kontz, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 677,095, Apr. 15, 1976, Pat. No. 4,097,570. This application Jul. 7, 1977, Ser. No. 813,781

Int. Cl.[2] B29C *3/00*

U.S. Cl. 425—393 **3 Claims**

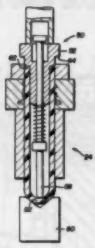
1. A molding apparatus for forming a finish and an adjacent support flange on an open end of a plastic tube, comprising:

a sectional forming mold defining means for receiving a plastic tube including a circular longitudinal opening, said opening including an annular support flange cavity longitudinally spaced from an annular finish cavity;

a vertically movable compression mandrel axially alignable with the opening in said forming mold, said mandrel including

(a) an essentially cylindrical projection telescopically insertable within a plastic tube in the mold and radially alignable with the cavities in said mold to internally support the tube and

(b) an annular ledge circumscribing the upper end of said projection for engaging and axially compressing one end of the tube to force plastic material radially outwardly into at least one of said annular mold cavities;



abutment means for engaging and supporting the other end of said tube including a vertical movable end abutment in a vertical alignment with said compression mandrel; and means for axially compressing said other tube end to force plastic material radially outwardly into the other of said annular mold cavities.

4,137,032

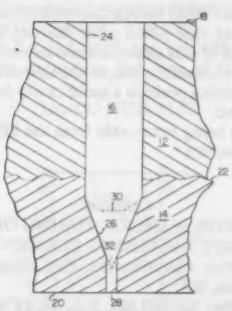
CORROSION-RESISTANT SPINNERET

Leland R. Honnaker, Wilmington, Del.; Gary L. Jones, Midlothian, and Walter E. Wood, Ridgeway, both of Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 720,849, Sep. 7, 1976, Pat. No. 4,054,468. This application Jun. 23, 1977, Ser. No. 809,201

Int. Cl.[2] B29F *3/04*

U.S. Cl. 425—464 **5 Claims**



1. A corrosion-resistant spinneret which comprises a backer plate selected from the group consisting of tantalum alloy and stainless steel, and an exit-face layer of annealed, surface-hardened commercially pure tantalum, the exit-face layer being about 0.025 to 0.04 inch thick and being bonded to the backer plate by a relatively thin transition layer composed of a mixture of the metals used in the backer plate and the exit-face layer, a counterbore extending through the backer plate and partially into the exit-face layer, a conically tapering section at the bottom of the counterbore, a spinneret capillary extending through the exit-face layer from the conically tapering section, the cross-sectional area of the capillary being about 3 to 12 square mils and substantially less than that of the counterbore, and the length of the capillary being greater than about 5 mils.

4,137,033

MANUFACTURE OF PNEUMATIC TIRES

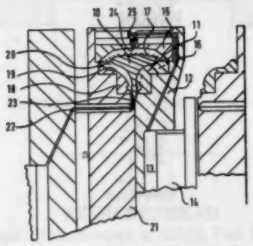
Anthony G. Goodfellow, Maghull, near Liverpool, England, assignor to Dunlop Limited, London, England

Division of Ser. No. 579,238, May 20, 1975, Pat. No. 4,052,496. This application Jul. 26, 1977, Ser. No. 819,161

Claims priority, application United Kingdom, May 28, 1974, 23576/74

Int. Cl.² B29H *3/10*; B29G *3/00*; B29H *5/02*

U.S. Cl. 425—542 **3 Claims**



1. An apparatus for the manufacture of a pneumatic tire having a tread portion and sidewalls, said apparatus comprising:

an annular solid mold core of cured rubber, said core having opposing sides defining sidewall molding surfaces and a radially outer periphery having a shape in radial section similar to the internal radial sectional shape of a tire to be molded;

a pair of rigid side plates each having a contour similar to that of one side of the core, said side plates being movable toward one another to contact and support the opposite sides of the core during molding of the tread portion of the tire on said core;

a tread molding ring adapted to surround the core when the latter is supported by said plates to define with the radially outer periphery of the core a mold cavity for the tire tread portion;

a pair of sidewall mold halves, said mold halves being substituted for said side plates after the tire tread portion is molded, each of said sidewall mold halves being shaped to define with a respective one of the sidewall surfaces of the core in a molding position a mold cavity for one of the tire sidewalls; and

said solid core being removable from the interior of the tire after manufacture.

4,137,034

APPARATUS FOR MANUFACTURING OF TRAINS OF SLIDE FASTENING ELEMENTS

George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.

Division of Ser. No. 659,881, Feb. 20, 1976, which is a continuation-in-part of Ser. No. 601,787, Aug. 4, 1975, Pat. No. 4,084,296. This application Jan. 30, 1978, Ser. No. 873,742

Int. Cl.² B29D *5/00*

U.S. Cl. 425—545 **10 Claims**

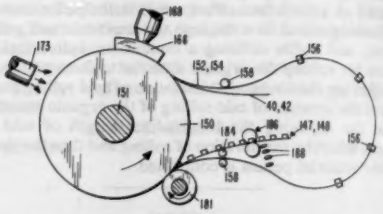
1. An apparatus for forming a train of fastening elements for a slide fastener comprising

a cavity wheel having a row of fastening element forming cavities extending around the periphery of the cavity wheel,

each of the fastening element forming cavities having a head forming portion and a pair of leg forming portions extending from opposite sides of the head forming portion,

said cavity wheel having a plurality of channels each extending from one of the pair of leg forming portions of each respective cavity to one side of the row of cavities,

a band for engaging the cavity wheel during a portion of the angular rotation of the cavity wheel to enclose the cavity wheel such that each of the channels extend to one side of the band, and



means for injecting a flowable synthetic polymer resin into the channels at the one side of the band and into the cavities enclosed by the band.

4,137,035

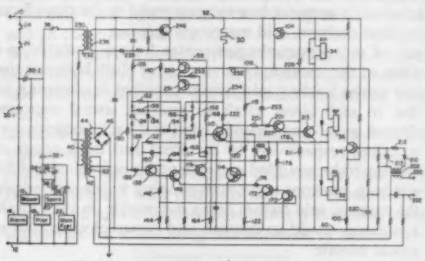
BURNER CONTROL APPARATUS

Phillip J. Cade, Winchester, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed Feb. 16, 1977, Ser. No. 769,307

Int. Cl.² F23N *5/00*

U.S. Cl. 431—78 **19 Claims**



1. Burner control apparatus for use with a fuel burner installation having an operating control to produce a request for burner operation, a flame sensor to produce a signal when flame is present in said fuel burner installation, and means responsive to said burner control apparatus for independently controlling pilot and main fuel flow, said burner control apparatus comprising:

a control device for actuating said fuel control means;

electronic circuit timing means for providing an ignition cycle having successive timing intervals including in sequence a preignition purge interval, a pilot ignition interval, a pilot stabilization interval, and a main fuel ignition interval which begins at the termination of the pilot stabilization interval and continues for a predetermined time after said pilot stabilization interval terminates;

means responsive to a request for burner operation to initiate said ignition cycle by actuating said electronic circuit timing means;

means responsive to said actuated circuit timing means for energizing said fuel control means at the end of said pilot stabilization interval to actuate said main fuel control means and initiate main fuel flow;

flame signal responsive means responsive to a signal from said flame sensor when sensing a flame to maintain said control device energized;

means responsive to failure to establish pilot flame during said pilot stabilization interval for preventing the production of further timing intervals by said timing circuit means; and

means responsive to loss of said signal from flame sensor

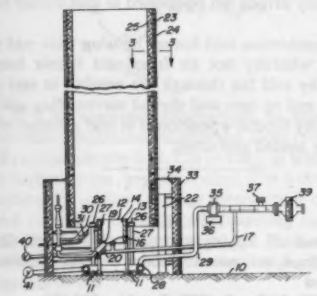
after said pilot stabilization interval to terminate all fuel flow and disable said timing circuit to prevent further ignition cycle operation.

4,137,036

FLARE BURNER

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited Incorporated, Jenkintown, Pa.

Filed Mar. 28, 1977, Ser. No. 781,849
Int. Cl.[2] F23M 9/00
U.S. Cl. 431—202 2 Claims



1. A flare burner comprising

a combustion chamber open at the top and at the bottom and having an upper margin and having a lower margin elevated above the ground for free entry of air at the bottom for supporting combustion,

a wall surrounding said combustion chamber in spaced relation thereto and having its lower margin disposed intermediate the upper and lower margins of said combustion chamber for free entry of air for distribution to said combustion chamber and free and uniform entry of air interiorly of said wall and providing a combustion space above said combustion chamber,

said wall extending upwardly above the top of said combustion chamber and being open at the top for the discharge of products of combustion,

members including a burner nozzle for supplying waste combustible gas to the center of the lower part of said combustion chamber for combustion therein,

a waste combustible gas supply manifold below said combustion chamber,

members including a plurality of burner nozzles spaced around the upper margin of said combustion chamber, connected to said supply manifold and supplying waste combustible gas upwardly in the air entry space between said combustion chamber and said wall for combustion of said waste gas,

a closed shielding wall member extending upwardly from the ground in surrounding relation to said wall and extending above the lower margin of said wall in spaced relation at its top for air entry over the top of said wall member and having a sound absorbing lining in sound absorbing relation to air delivered over said wall member and below said wall and to said combustion chamber,

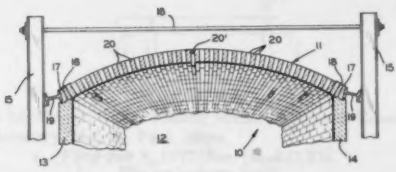
said shielding wall member preventing access of air except at its top.

4,137,037

METHOD OF REPAIRING FURNACE ROOFS DURING HEAT-UP

Lloyd W. Daman, Pemberville; Don V. Marti, II; Michael L. Newsom, both of Toledo, and Donald E. Shamp, Millbury, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 6, 1977, Ser. No. 839,805
Int. Cl.[2] F27D 1/16
U.S. Cl. 432—3 3 Claims



1. A method of preventing individual bricks from dropping from a sprung arch roof of a furnace during initial heat-up thereof comprising the steps of:

a. visually observing the interior surface of said sprung arch roof and detecting any individual bricks which change position and project below said surface;

b. grasping said individual brick projecting from the top and removing said brick from said roof;

c. applying mortar to the sides of said removed brick; and

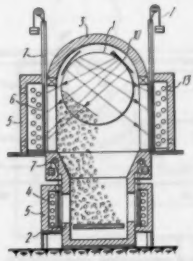
d. re-inserting said mortar coated brick in said roof.

4,137,038

CLINKER ROASTING PLANT

Leonid T. Vorobeichikov, and Vitaly G. Golovnya, both of Kharkov, U.S.S.R., assignors to Gosudarstvenny Vsesojuzny Institut po Proektirovaniju i Nauchno-Issledovatelskim rabotam "JUZHGIPROTSEMENT", U.S.S.R.

Filed Jun. 7, 1977, Ser. No. 804,267
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1976, 2418207
Int. Cl.[2] F27D 15/02
U.S. Cl. 432—77 11 Claims



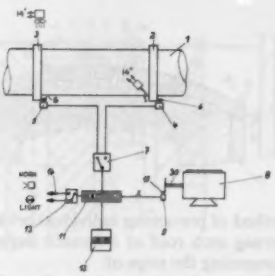
1. A clinker roasting plant comprising: a rotary kiln having a housing and a hot head; a cooler for cooling clinker mounted downstream of said rotary kiln; heat-exchange tubes arranged in a zone of flow of roasted clinker from a hot end of said kiln housing to a place of discharge of finished clinker from said cooler; a heat insulating casing surrounding said heat-exchange tubes and having at least one movable wall for selectively communicating an inner space of said heat insulating casing with an inner space of said zone of flow of clinker.

4,137,039

MEANS FOR THE MEASUREMENT OF RELATIVE MOVEMENT BETWEEN LOOSE RACEWAYS AND A REVOLVING DRUM MOUNTED IN THE RACEWAYS

Heinz Stolzenberg, Burglengenfeld, Fed. Rep. of Germany, assignor to KHD Industrieanlagen AG, Fed. Rep. of Germany

Filed Jan. 28, 1977, Ser. No. 763,518
Int. Cl.[2] F27B *7/00, 7/20*
U.S. Cl. 432—103 **7 Claims**



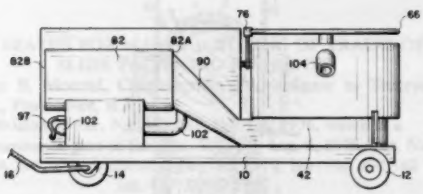
1. A control system for use with rotary kilns comprising:
at least two loose raceways;
a revolving drum mounted in said raceways;
a drive motor with gear input shaft for driving the drum at a predetermined speed;
a contactless pulse generator also driven by said drive motor for generating pulses to indicate each revolution of the motor shaft;
at least one of said loose raceways having a contactless pulse generator therewith for generating pulses corresponding to the revolutions thereof; and
counter means responsive to the pulses from both the drive motor pulse generator and the at least one loose raceway pulse generator and responsive thereto for indicating the counted numbers of revolutions.

4,137,040

FOOTBALL DRIER

Walter D. Starkey, 11769 S. 77 E. Ave., Bixby, Okla. 74008, and Rolland W. Chaney, 3717 E. 46 St., Tulsa, Okla. 74135

Filed Sep. 6, 1977, Ser. No. 830,842
Int. Cl.[2] F27B *9/02;* **F26B** *25/00*
U.S. Cl. 432—128 **7 Claims**



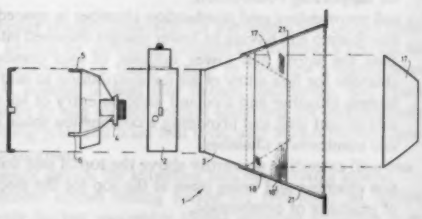
1. A football drying apparatus comprising:
a frame having wheels and means to guide the wheels so that the frame may be moved about;
a vertical axle rotatably supported at its lower end to said frame;
a carousel affixed to said vertical axle, the carousel having a plurality of radial partition walls defining a plurality of compartments, each dimensioned to freely receive a football therein;
a cylindrical stationary plenum chamber below said carousel, the bottom of the carousel having openings therein permitting the passage of air from the plenum chamber into the carousel;
a cylindrical shroud surrounding said carousel, the top of the shroud having an opening therein by which a football may be placed into or removed from said carousel compartment, the top of the shroud having a central opening therein rotatably receiving said axle;
means affixed to said axle above said top of said shroud for rotating said axle to thereby rotate said carousel whereby said compartments in said carousel may be selectively brought below said opening in said shroud top to permit footballs to be deposited into or retrieved from said compartments;
a fuel tank supported on said frame;
a burner housing supported on said frame having a burner therein connected to said fuel tank;
an electrically driven fan positioned in said burner housing; and
a conduit connecting said burner housing with said plenum chamber whereby hot air from said burner housing is directed by said fan through the conduit to said plenum chamber and up into said shroud surrounding said carousel whereby footballs positioned in said carousel compartments are heated and dried.

4,137,041

HEATERS

Victor C. Woodroff, Epping, and John S. Walford, Shenfield, both of England, assignors to Jetaire Company Limited, London, England

Filed May 5, 1977, Ser. No. 794,103
Claims priority, application United Kingdom, May 6, 1976, 18686/76
Int. Cl.[2] F23D *11/02*
U.S. Cl. 432—222 **11 Claim**



1. A heater comprising:
a housing through which air can be sucked;
a fluid fuel burner located axially in the housing and spaced from the walls of the housing thereby to heat part only of the air passing through the housing;
a coaxial convergent guide ring the wall of which is imperforate and extends inwardly from the wall of the housing downstream of the burner; and
one or more openings in the housing downstream of the mouth of the guide ring to admit ambient air for mixing with the heated air downstream of the guide ring, the wall of the housing upstream of the mouth of the guide ring being imperforate and shaped to provide the housing with a divergent portion upstream of the convergent guide ring.

4,137,042

DRY HEAT PROCESS FOR DYEING AND PRINTING ORGANIC MATERIAL WHICH CAN BE DYED WITH CATIONIC DYES

Raymond Défago, Rieben; Stefan Koller, Ramlinsburg, and Peter Moser, Binningen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

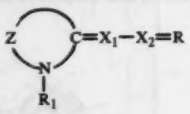
Filed May 8, 1975, Ser. No. 576,193

Claims priority, application Switzerland, May 20, 1974, 6884/74; Feb. 13, 1975, 1787/75

Int. Cl.[2] D06P 5/00

U.S. Cl. 8—2.5 A 12 Claims

1. In a dry heat transfer process for the dyeing, printing or optical brightening of organic material susceptible to dyeing with cationic dyes which comprises (1) bringing the surface of the said organic material to be dyed, printed or optically brightened into contact with the treated surface of an inert carrier, said surface being treated with a printing ink containing at least one finely divided, electroneutral, deprotenized cationic dye or fluorescent brightener of the formula



wherein R is an aromatic, heterocyclic or aliphatic radical which contains a deprotonized nitrogen atom (=N—), each of X_1 and X_2 independently is N, CH or CR_2, in which R_2 is alkyl of 1 to 4 carbon atoms, aryl or aralkyl, Z is a divalent radical which optionally contains further heteroatoms or fused rings and which completes the nitrogen-containing ring to form an unsaturated 5- or 6-membered ring, and R_1 is substituted or unsubstituted alkyl, and the deprotonized nitrogen atom in R is in conjugation to the

group, irrespective of the length of the conjugation system which advantageously extends over 3 to 17 members, (2) subjecting the said organic material and inert carrier while in contact to a heat treatment of 120° C. to 210° C., and (3) separating the said organic material from the said inert carrier, the improvement according to which the printing ink employed to treat the surface of the inert carrier additionally contains an indicator dye which does not exhibit acid reaction.

4,137,043

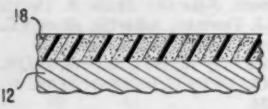
METHOD OF PRODUCING A DYEABLE COATING ON A METAL ARTICLE

Lornie J. Bernier, Guys Mills, and Tapan K. Das, Meadville, both of Pa., assignors to Textron, Inc., Providence, R.I.

Division of Ser. No. 501,371, Aug. 28, 1974, Pat. No. 3,939,547. This application Nov. 28, 1975, Ser. No. 636,265

Int. Cl.[2] D06P 3/24; B05D 1/04, 3/02

U.S. Cl. 8—4 11 Claims



1. A method of producing a colored coating on a metal article, comprising the steps of:

(a) depositing on the metal article a coating of powdered solid polymer resin containing a substantial quantity of active proton acceptor groups which are subject to irreversible transformation by heating above a predetermined temperature,

(b) heating the coating to a temperature sufficient to convert the coating into a coherent polymer film and below the predetermined temperature of irreversible transformation,

(c) maintaining a substantial quantity of active proton acceptor groups untransformed in the coherent polymer film, and

(d) dyeing the polymer film with an aqueous dye solution to form a colored coating on the article.

4,137,044

METHOD OF WASHING

David M. Flower, Grand Rapids, Mich., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Jul. 8, 1977, Ser. No. 813,874

Int. Cl.[2] B08B 3/00

U.S. Cl. 8—137 18 Claims

1. A multi-step process for laundering oil soiled fabric, said process comprising:

laundering said fabric in a first aqueous bath including a lipophilic surfactant which imparts oil-solubilizing characteristics to said first aqueous bath,

separating said fabric from said first aqueous bath,

laundering said fabric in a second hydrophilic aqueous bath including hydrophilic detergent and,

separating said fabric from said second hydrophilic aqueous bath.

4,137,045

METHOD FOR TREATING A TEXTILE WEB WITH STEAM

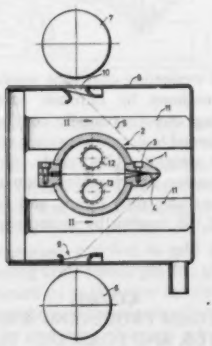
Hans Brugman, Deldenbroek, Netherlands, assignor to Brugman Machinefabriek B.V., Netherlands

Continuation of Ser. No. 612,048, Sep. 10, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 782,009

Claims priority, application Netherlands, Sep. 13, 1974, 7412216

Int. Cl.[2] D06B 5/08, 21/02

U.S. Cl. 8—149.1 6 Claims



1. A method for treating a textile web with a fluid medium, said method comprising the steps of passing a textile web over a slit formed in an elongated nozzle and in firm contact with said nozzle and simultaneously passing steam through said slit towards said web at a speed approximately equal to the speed of sound.

4,137,046

TRANSPARENT CELLULOSIC PAPER AND METHOD FOR MAKING THE SAME

Takashi Koike, and Masahiro Amano, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Oct. 4, 1976, Ser. No. 728,920

Claims priority, application Japan, Oct. 7, 1975, 50-121131; Nov. 29, 1975, 50-143084; Apr. 19, 1976, 51-44246

Int. Cl.[2] B32B *29/06*; B05D *5/00*

U.S. Cl. 8—192 7 Claims

1. A method for producing a transparent cellulosic paper which consists essentially of coating or impregnating a cellulosic paper with an organic solvent solution consisting essentially of the organic solvent and a compound having a weight-average molecular weight of 200 to 2,000 and having at least two isocyanate groups in the molecule; removing said organic solvent; and allowing the resulting coated or impregnated cellulosic paper to harden by aging, the amount of said compound being sufficient to make the cellulosic paper transparent by filling the pores of the cellulosic paper.

4,137,047

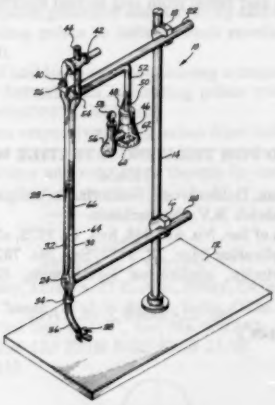
METHOD OF DETERMINING CORROSION RESISTANCE OF ANODIZED ALUMINUM

Duk H. Kim, Bellevue, Wash., assignor to Boeing Commercial Airplane Company, Seattle, Wash.

Filed Sep. 27, 1977, Ser. No. 836,942

Int. Cl.[2] G01N *7/18, 17/00, 33/20*

U.S. Cl. 23—230 C 4 Claims



1. A method of evaluating corrosion resistance of a coating generated on aluminum by chromic acid anodizing, the method comprising: covering anodic coating aluminum with an aqueous alkali metal hydroxide having a concentration of up to about 1% by weight of hydroxide, directing hydrogen generated by a reaction between aluminum and the hydroxide into a displacement indicating means, and determining corrosion resistance of the coating by measuring time versus displacement.

4,137,048

INSULATING FOAM PRODUCING AND DELIVERING APPARATUS, AND FOAM GUN THEREFOR

Gerald H. Steinman, 17 Ironwood La., Millis, Mass. 02045

Filed Jul. 18, 1977, Ser. No. 816,426

Int. Cl.[2] B01F *3/10, 5/04, 15/04*

U.S. Cl. 422—133 20 Claims

1. Insulating foam producing and deliving apparatus comprising

a foaming agent supply;

a foaming agent supply conduit;

means for pumping said foaming agent from said supply through said conduit;

means for adjusting the pressure of said foaming agent pumping;

a resin supply;

a resin supply conduit

means for pumping resin from said supply through said conduit;

means for adjusting the pressure of said resin pumping;

an air supply conduit;

means for compressing the air in said supply conduit;

means for regulating the pressure of said air compressing;

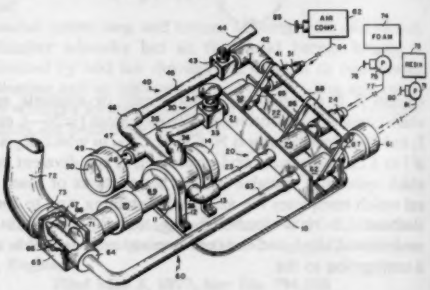
a foam gun comprising

a base,

a foam generating chamber supported on said base,

a foaming agent line supported on said base, inletting to said foam generating chamber, and coupled to said foaming agent supply conduit,

an air line supported on said base, inletting to said foam generating chamber, and coupled to said air supply conduit;



a resin injector nozzle,

a resin line supported on said base, inletting to said resin injector nozzle, and coupled to said resin supply conduit;

means in said foam generating chamber for creating a complete foam mixture therewithin of the foaming agent and air supplied thereto, said mixing means comprising a free spinning propeller in said foam generating chamber turned at high speed by said inletted air and foaming agent to thereby create a mixing turbulence that whips the air and foaming agent into the desired foam,

a foam combining chamber surrounding said resin injector nozzle,

a discharge line conducting said foam mixture from said foam generating chamber to said foam combining chamber, and

a foam applicator line outletting from said resin injector nozzle and from said nozzle surrounding, foam combining chamber, and in which takes place all mixing of said resin with said foam.

4,137,049

DEVICE FOR USE AS AN ELAPSED TIME INDICATOR OR TIME TEMPERATURE INDICATOR

Thomas W. Couch, Asheville; James A. Harvey, Enka, and Gerardus L. J. Tummers, Asheville, all of N.C., assignors to Akzona Incorporated, Asheville, N.C.

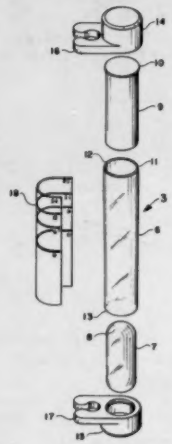
Filed May 10, 1977, Ser. No. 795,582

Int. Cl.[2] G01D *13/00*; G01N *31/06, 31/22*

U.S. Cl. 422—56 19 Claims

1. A device for indicating the elapse of time comprising: a container, a vapor generating means enclosed in said container, said vapor generating means including a first chemical having a vapor pressure, a carrier enclosed in said container, a mixture including a second chemical, an indicator, and a gel forming agent impregnated in said carrier; the longitudinal outer surface of said mixture being in contact with a portion of the

longitudinal inner surface of said container, said second chemical having a pH value different from said first chemical, said indicator responsive to a change in PH value due to the reaction of said first and second chemicals; the viscosity of said mixture impregnated in said carrier being of such a value so as to provide that said second chemical and said indicator are



substantially uniformly held in a dispersion in said carrier and further to provide an impedance to the movement of the vapor through said carrier, whereby substantially accurate indication of the elapse of a predetermined time after activation of said vapor generating means is indicated for certain temperature ranges.

4,137,050

COAL DESULFURIZATION

Stephen L. Grant, Stow, Ohio, assignor to Standard Oil Company (Ohio), Cleveland, Ohio

Filed Mar. 31, 1978, Ser. No. 892,000
Int. Cl.[2] C10L *9/10*; C10B *57/00*; C22B *1/11*
U.S. Cl. 44—1 R **11 Claims**

1. A process for removing sulfur from coal comprising contacting the coal with a leachant comprising an aqueous solution containing the hexacyanoferrate (III) ion.

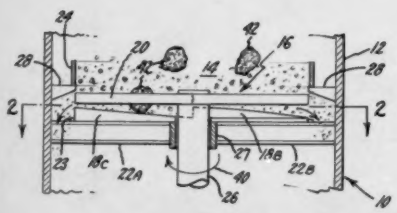
2. The process of claim 1 wherein said leachant has an acid pH.

4,137,051

GRATE FOR COAL GASIFIER

Stanley J. Godwin, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jan. 6, 1978, Ser. No. 867,380
Int. Cl.[2] C10J *3/72*
U.S. Cl. 48—66 **11 Claims**



1. In an apparatus for producing a fuel gas from coal including a shaft disposed over an enclosed grate assembly whereby coal moving by gravity down said shaft is subjected first to carbonization and then to reduction, the improvement for reducing the size of clinkers wherein said grate assembly comprises, in combination:

(A) a generally cylindrical platform including means in the upper surface thereof for defining a generally radially extending notch therein and

(B) means rotatable relative to said platform in a plane generally parallel thereto and in register with said notch-defining means to co-act therewith in a scissors-like action.

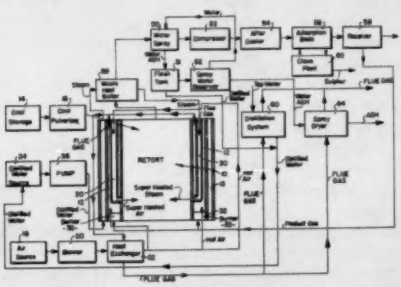
9. In a process for producing a fuel gas from coal by subjecting the coal to carbonization and then to reduction as it moves by gravity down a shaft, with the solids remaining at the lower end of said shaft being removed from the gasification process by passage through a grate structure including a platform, the improvement comprising the step of: reducing the size of clinkers contained in the solids on the platform by trapping the clinkers in a notch defined in the upper surface of said platform by a generally upright wall and an inclined surface thereof and simultaneously applying a shearing force to the clinkers by rotating an arm relative to said notch in cooperation with said upright wall to effect size reduction of the trapped clinkers in a vertical dimension thereof to a value of not more than the height of the wall above the inclined surface.

4,137,052

APPARATUS AND SYSTEM FOR PRODUCING COAL GAS

Anthony A. du Pont, 12 Outrider Rd., Rolling Hills, Calif. 90274, and Joseph A. Connell, 24815 S. Normandie Ave., Harbor City, Calif. 90710

Continuation-in-part of Ser. No. 765,881, Feb. 7, 1977, abandoned, which is a continuation of Ser. No. 682,257, May 3, 1976, abandoned. This application Aug. 17, 1977, Ser. No. 825,271
Int. Cl.[2] C10B *3/02*
U.S. Cl. 48—89 **8 Claims**

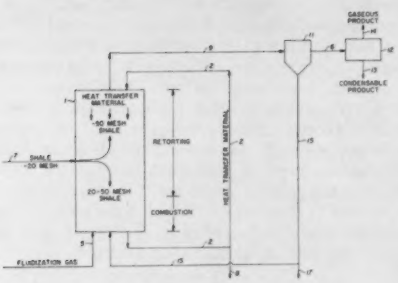


1. Apparatus for producing coal gas comprising: a retort having a central reaction column surrounded by a wall and having an outlet for hot coal gas produced by the reaction column; means for introducing pulverized coal, or the like, into the reaction column; wall means forming an annular chamber surrounding said first-named column in coaxial relationship therewith; burner means coupled to said annular chamber; means for introducing combustible gas and air into the annular chamber to be burned by said burner means so as to produce hot flue gas passing through the annular chamber for maintaining the wall of the reaction column at a temperature higher than the interior temperature of the reaction column so that heat is directed inwardly through the wall into the interior of the reaction column; further wall means forming a second annular chamber surrounding the firstnamed annular chamber; and means for introducing water into said second annular chamber to be heated by heat from said first-named annular chamber.

4,137,053
GASIFICATION PROCESS

David S. Mitchell, and David R. Sageman, both of San Rafael, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 811,496, Jun. 30, 1977, which is a continuation-in-part of Ser. No. 727,558, Sep. 28, 1976, abandoned. This application Mar. 17, 1978, Ser. No. 887,700
Int. Cl.[2] C10J *3/46, 3/54*
U.S. Cl. 48—197 R 11 Claims



1. A continuous process for gasifying hydrocarbon-containing solids in a vertically elongated gasification zone, said gasification zone including means for substantially impeding vertical back mixing of vertically moving solids substantially throughout said gasification zone, which comprises:

(a) introducing particulate solid heat-transfer material at an elevated temperature into an upper portion of said gasification zone;

(b) maintaining an upward flow of a steam-containing fluidization gas through said gasification zone at a rate sufficient to maintain said heat-transfer material in a fluidized state;

(c) introducing into an intermediate level of said gasification zone a first portion of hydrocarbon-containing solids which is entrained by said fluidization gas and flows upwardly in plug flow through said gasification zone and reacts with said fluidization gas forming a first portion of partially gasified solids and a first portion of combustible gas;

(d) introducing into an intermediate level of said gasification zone a second portion of hydrocarbon-containing solids which is fluidized by said fluidization gas and which reacts with said fluidization gas forming a second portion of partially gasified solids and a second portion of combustible gas;

(e) reacting said second portion of said partially gasified solids in a lower level of said gasification zone with an oxygen-containing gas thereby forming combusted solids and a noncombustion-supporting fluidization gas, whereby said heat-transfer material is heated to an elevated temperature;

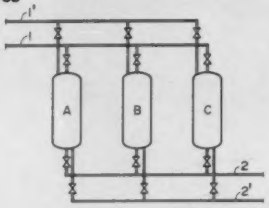
(f) maintaining a substantially net downward plug flow of said heat-transfer material and said second portion of said hydrocarbon-containing solids through said gasification zone by withdrawing from a bottom portion of said gasification zone a first effluent stream comprising said heat-transfer material, said effluent stream being withdrawn at an elevated temperature;

(g) withdrawing from an upper portion of said gasification zone a second effluent stream comprising a product combustible gas and said first portion of said partially gasified solids.

4,137,054
PURIFICATION OF FORMALDEHYDE BY SEPARATION

Tetsuya Miyake, Tokyo; Kunihiko Takeda, Yokohama; Naoki Miyata, Kawasaki; Tatsushi Saeki, Yokohama, and Maomi Seko, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 17, 1977, Ser. No. 760,218
Claims priority, application Japan, Jan. 22, 1976, 51-5447
Int. Cl.[2] B01D *53/04, 53/28*
U.S. Cl. 55—33 15 Claims

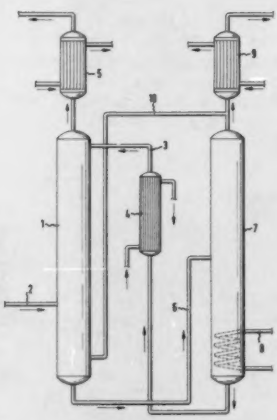


1. A process for purification of formaldehyde by separation, which comprises contacting a mixture containing formaldehyde and water with an adsorbent selected from the group consisting of type A synthetic zeolites wherein the exchangeable cations contain at least one of the Group IA, from the fourth to the sixth period, and Group IIA, the sixth period, of the Periodic Table of Elements thereby selectively to adsorb water on said adsorber and to leave a stream enriched in formaldehyde, said zeolite having been pretreated with a treating agent selected from the group consisting of phosphoric acid and salts thereof.

4,137,055
PROCESS FOR SEPARATING TETRAFLUOROETHYLENE FROM NITROGEN AND CARBON MONOXIDE

Reinhard A. Sulzbach, Burghausen, Salzach, and Georg Oberauer, Burgkirchen, Alz, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 23, 1977, Ser. No. 827,104
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1976, 2638650
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—71 3 Claims



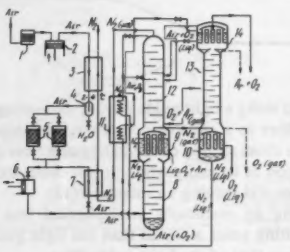
1. A process for separating tetrafluoroethylene from a gaseous mixture containing, in addition to tetrafluoroethylene, a

member of the group consisting of nitrogen, carbon monoxide and mixtures thereof, which comprises contacting said gaseous mixture with a liquid absorption medium selected from the group consisting of saturated aliphatic ketones containing 3 to 6 carbon atoms and mixtures thereof having a boiling point in the range of from +50° C. to +130° C., and being present in an amount of from 0.5 to 20 liters per liter of tetrafluoroethylene in said gaseous mixture, whereby absorbing the tetrafluoroethylene in said absorption medium, separating and removing said member, and then heating said absorption medium to its boiling point whereby the tetrafluoroethylene is recovered.

4,137,056
PROCESS FOR LOW-TEMPERATURE SEPARATION OF AIR

Georgy A. Golovko, bulvar A. Tolstogo, 16, kv. 29, Pushkin, Leningrad, U.S.S.R.

Continuation of Ser. No. 568,856, Apr. 17, 1975, abandoned. This application Mar. 2, 1977, Ser. No. 776,515
Claims priority, application U.S.S.R., Apr. 26, 1974, 2015808
Int. Cl.[2] F25J *3/02, 3/03, 3/08*
U.S. Cl. 62—13 **1 Claim**

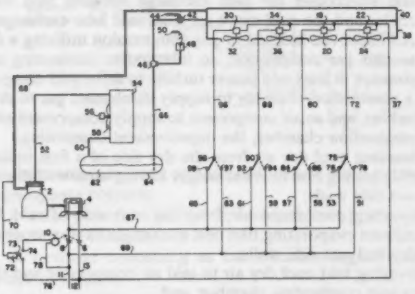


1. A process for low temperature separation of air which comprises removing dust from air; compressing the dedusted air to 180–200 kg/cm^2; purifying the compressed air by removing carbon dioxide and acetylene therefrom, drying to a due point of −60° C. to −70° C. and cooling at a temperature below the condensation temperature, thus partially condensing the air; subjecting the cooled and partially condensed air to primary rectification in a high pressure column to produce, at the top reflux condenser, liquified nitrogen containing less than 0.5 vol.% of oxygen and argon and at the bottom of the column oxygen-enriched liquified air containing 32–36 vol.% of oxygen, 1.5–1.8 vol.% of argon and 60.2–66.5 vol.% of nitrogen; supercooling said liquified nitrogen and oxygen-enriched air; subjecting the supercooled air enriched with oxygen to secondary rectification by said supercooled liquified nitrogen in a low pressure column, to obtain from the top of said low pressure column gaseous nitrogen containing less than 0.3 vol.% of oxygen and argon impurities, a gaseous oxygen-argon mixture containing 7–10 vol.% of argon and a liquified oxygen-argon mixture containing up to 4.5 vol.% of argon and less than 0.01 vol.% of nitrogen; and subjecting said gaseous oxygen-group mixture to a further rectification in a second low pressure column to produce an argon-oxygen mixture containing argon with impurities of 3–0.1 vol.% of oxygen and less than 0.1 vol.% of nitrogen, as well as oxygen with a concentration of 99.7–99.9 vol.% oxygen.

4,137,057
REFRIGERATING SYSTEMS WITH MULTIPLE EVAPORATOR FAN AND STEP CONTROL THEREFOR

Zenon Piet, Princeton, N.J., and Daniel Kramer, Yardley, Pa., assignors to Kramer Trenton Co., Trenton, N.J., by said Zenon Piet

Filed Feb. 4, 1977, Ser. No. 765,805
Int. Cl.[2] F25D *17/06*
U.S. Cl. 62—89 **2 Claims**



1. An improved refrigeration system comprising a compressor having an ON condition and an OFF condition; control means for establishing said ON and OFF conditions; at least one evaporator; a first fan positioned to move air over an evaporator, said fan having an ON condition; a second fan, positioned to move air over an evaporator, said second fan having an ON condition and an OFF condition; wherein the improvement comprises: means for achieving substantial correspondence between

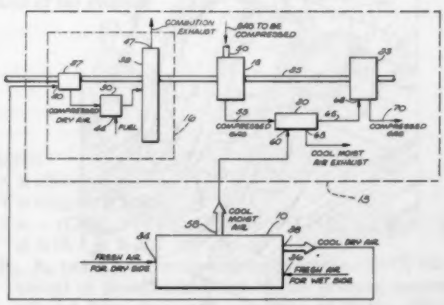
(a) compressor in the OFF condition and an evaporator fan in the OFF condition, and

(b) compressor in the ON condition and said fan in the ON condition.

4,137,058
PRE-COOLER

Leslie A. Schlom, 5524 Saloma Ave.; Michael B. Dubey, 5518 Saloma Ave., both of Van Nuys, Calif. 91411, and Andrew J. Becwar, 818 Old Landmark La., La Canada, Calif. 91011

Continuation-in-part of Ser. No. 601,873, Aug. 4, 1975, Pat. No. 4,023,949. This application May 13, 1977, Ser. No. 796,800
Int. Cl.[2] F28C *1/00;* **F28D** *5/00;* **F25B** *1/10*
U.S. Cl. 62—121 **14 Claims**



1. In a gas compression system having first and second gas compressors, an intercooler connecting said compressors, at least one power turbine to drive said compressors, a combustion chamber to supply combusted gas to drive said turbine, and an air compressor to supply compressed air to said combustion chamber, the improvement comprising:

an indirect evaporating film heat exchanger having sepa-

rated dry and wet sides and formed with a first conduit for exhausting cool dry air from the dry side of said heat exchanger, and a second conduit for exhausting cool moist air from the wet side of said heat exchanger;

means for connecting said first heat exchanger conduit to the air compressor of said power turbine conveying said cool dry air from the heat exchanger to said turbine air compressor for supply thereby to said combustion chamber; and

means for connecting said second heat exchanger conduit to said intercooler for heat exchange between said intercooler and the cool moist air from said heat exchanger.

8. An improved method of gas compression utilizing a first and second gas compressor, an intercooler connecting said compressors, at least one power turbine to drive said compressors, a combustion chamber to supply combusted gas to drive said turbine, and an air compressor to supply compressed air to said combustion chamber, the improvement comprising:

exhausting cool dry air from the dry side of a first indirect evaporating film heat exchanger having separated dry and wet side walls;

exhausting cool moist air from the wet side of said first indirect evaporating film heat exchanger having separated dry and wet side walls;

conveying said cool dry air to said air compressor and then to said combustion chamber; and,

conveying said cool moist air to said intercooler for heat exchange between said intercooler and said cool moist air.

4,137,059

METHOD AND APPARATUS FOR MAKING FIBERS FROM ATTENUABLE MATERIALS

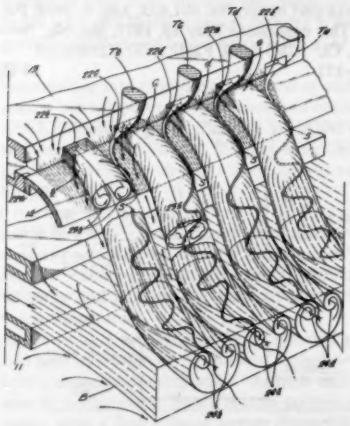
Marcel Levecque, Birchrunville, Pa.; Jean A. Battigelli, and Dominique Plantard, both of Rantigny, France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Continuation-in-part of Ser. No. 780,589, Mar. 24, 1977, Pat. No. 4,070,173, and Ser. No. 762,789, Jan. 25, 1977, Pat. No. 4,102,662, and Ser. No. 676,755, Apr. 14, 1976, which is a continuation-in-part of Ser. No. 557,282, Mar. 11, 1975, Pat. No. 4,015,964, which is a continuation-in-part of Ser. No. 353,984, Apr. 24, 1973, Pat. No. 3,886,940. This application Sep. 19, 1977, Ser. No. 834,537

Claims priority, application France, Aug. 23, 1977, 77 25692

Int. Cl.[2] C03B *37/04*

U.S. Cl. 65—5 **10 Claims**



1. A process for attenuating attenuable material comprising generating a plurality of jets with the jet cores centered in spaced side by side median planes and initially directed in a common plane transverse to the median planes and each jet being of greater cross sectional dimension in said common plane than in a direction transverse to said common plane, deflecting the jets including the flow induced by the jet cores from said common plane by subjecting the jets to the Coanda effect of a convexly curved surface, the jets being spaced from each other and the induced flow of the jets developing zones of laminar flow in regions overlying the Coanda surface between adjoining jets, delivering streams of attenuable material intermediate said median planes into said zones of laminar flow to be carried thereby into the jet flow and effect attenuation of the streams, and generating a gaseous blast of cross section greater than that of the individual deflected jets directed transverse to the deflected jets, the deflected jet flow having higher kinetic energy per unit of volume than the blast and penetrating the blast to develop toration zones into which the streams of attenuable material are carried by the deflected jets.

4,137,060

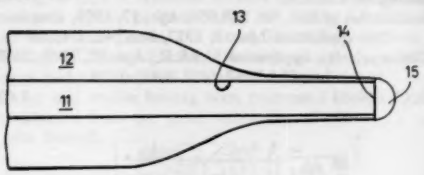
METHOD OF FORMING A LENS AT THE END OF A LIGHT GUIDE

Christian Timmermann, Eschollbrucken, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 816,892, Jul. 18, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,138

Int. Cl.[2] C03C *15/00*; C03B *11/08*; G02B *5/14*

U.S. Cl. 65—31 **9 Claims**



1. Method to make a light guide having a coupling to couple a light guide fiber to a radiator comprising the steps of

reducing the cross section of the light guide fiber (**11**, **12**, **13**) in the region of its end portion to just about the core (**11**) of the fiber and leaving an interface (**13**);

and attaching an essentially semispherical lens (**15**) of a lower melting point material than the light guide fiber to the end face (**14**) of the light guide fiber.

4,137,061

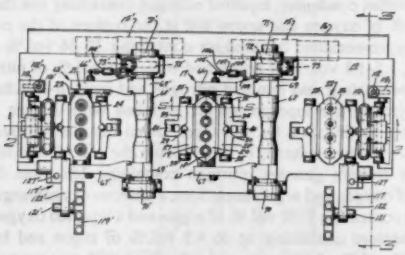
APPARATUS FOR FORMING GLASS CONTAINERS

James D. Mallory, and Richard T. Kirkman, both of Maumee, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 7, 1977, Ser. No. 775,132

Int. Cl.[2] C03B *9/16*

U.S. Cl. 65—232 **15 Claims**



1. Apparatus for forming lightweight glass containers by the blow and blow process wherein a plurality of charges of glass at an elevated temperature are delivered to a plurality of parison forming mold cavities with aligned neck molds and a

vacuum is applied to the neck molds to settle the charges therein, the improvement comprising:

a source of low pressure air;

a neck mold supporting arm;

means for immediately delivering counterblow air under low pressure in the range of 1–10 psi to the interior of the neck molds for a time sufficient to cause the charges of glass to just expand into the full shape of the parison cavities;

means connected to the neck mold supporting arm for inverting and transferring the parisons carried thereby from the parison molds to blow molds;

said neck mold supporting and transferring means including:

(a) means for maintaining air within the interior of the formed parisons at sufficient level of pressure therein to assist in supporting the parisons during transfer; and

(b) means for opening the neck molds to release the parisons at the blow mold station wherein the parisons are expanded to final shape.

4,137,062

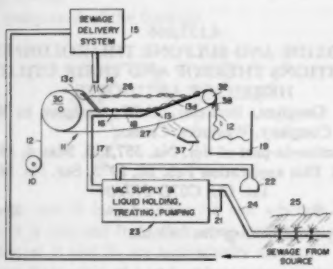
FILTRATION WITH A COMPOSTABLE FILTER MEDIUM

Steven B. Mullerheim, Kensington, and Fred G. Williams, Jr., San Anselmo, both of Calif., assignors to Great Circle Associates, Walnut Creek, Calif.

Filed Dec. 20, 1976, Ser. No. 752,201

Int. Cl.² C05F *11/08*; B01D *33/04*

U.S. Cl. 71—9 **25 Claims**



7. A process for treating fresh sewage containing organic liquid and solid wastes, comprising:

delivering the fresh sewage to a filtering station while the solids still retain substantial structural integrity, before they have deteriorated or have become significantly blended with the liquid;

separating the solids from the liquids by filtration soon after the newly delivered fresh sewage has reached the filtering station, through an organic compostible filter medium, thereby enhancing filtration efficiency and producing a liquid filtrate low in suspended solid material;

composting the solids along with used filter medium; and

dispensing the nutrient-rich liquid filtrate to unsaturated ground.

4,137,063

PRODUCTION OF POTASSIUM POLYPHOSPHATES FROM POTASSIUM SILICOFLUORIDES

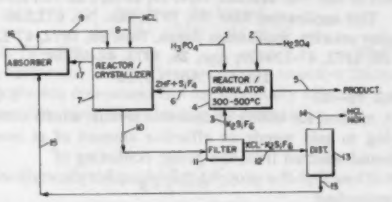
John B. Sardisco, Shreveport, La., assignor to Pennzoil Company, Shreveport, La.

Filed Jun. 24, 1977, Ser. No. 810,002

Int. Cl.² C05B *21/00, 11/04*

U.S. Cl. 71—51 **11 Claims**

1. A method for the production of a solid potassium polyphosphate polymer containing crystalline KPO_3, crystalline K_2SO_4, amorphous polyphosphates, $K_2P_2O_7$, and unconverted K_2SiF_6, which comprises reacting potassium fluosilicate which has been separated from other inorganic materials with a mixture of phosphoric acid and sulfuric acid at a temperature of 250°–500° C., wherein the amount of phosphoric acid reacted corresponds to a molar ratio of P_2O_5:K_2O in the range of 4:1 to 1:1, and wherein 0.05–0.95 moles of sulfuric acid are reacted per mole of potassium fluosilicate, the reaction being conducted for a sufficient period of time to evolve fluorides



from the reacting mixture and to produce said solid potassium polyphosphate polymer.

8. A solid potassium polyphosphate polymer produced by the reaction of claim 1.

9. A fertilizer containing as the effective ingredient, the polymer of claim 8.

4,137,064

UNSATURATED DIESTERS OF β-HALOETHANEPHOSPHONATES AND DITHIOPHOSPHONATES AS PLANT GROWTH REGULATOR

Werner Trueb, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

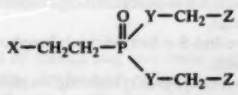
Division of Ser. No. 612,501, Sep. 11, 1975, Pat. No. 4,042,370. This application Jun. 6, 1977, Ser. No. 803,792

Claims priority, application Switzerland, Sep. 18, 1974, 12677/74

Int. Cl.² A01N *9/36*

U.S. Cl. 71—86 **5 Claims**

1. The method of regulating the growth of plants or regulating plant secretion comprising applying to the plant a growth regulating or secretion regulating effective amount of a compound of the formula:



wherein

X is chloro or bromo,

Y is oxygen or sulfur,

Z is $-(CH_2)_m-CR_5{=}CHR_6$ or $-(CH_2)_m-C\equiv C-R_7$, m is 0, 1 or 2, and

R_5, R_6 and R_7 are independently hydrogen, C_1–C_8 alkyl, phenyl or phenyl substituted by one or more members selected from the group consisting of fluoro, chloro, bromo, cyano, carboxy, C_2–C_8 alkoxycarbonyl, C_2–C_8 alkylcarbamoyl, trihaloalkyl, C_1–C_8 alkylsulphinyl, unsubstituted phenylsulphinyl, phenylsulphinyl substituted by a methyl or ethyl group or two methyl groups, C_1–C_8 alkylsulphonyl, unsubstituted phenylsulphonyl, phenylsulphonyl substituted by a methyl or ethyl group or two methyl groups, and nitro.

4,137,065

AMIDO PHOSPHOROTHIOLATE PESTICIDE

Takeo Satomi, Nishinomiya; Naganori Hino; Masachika Hirano, both of Toyonaka; Kunio Mukai, Nishinomiya; Hideo Sakamoto, Toyonaka, and Ryo Yoshida, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

Division of Ser. No. 416,205, Nov. 15, 1973, Pat. No. 3,997,526. This application Mar. 31, 1976, Ser. No. 672,536

Claims priority, application Japan, Nov. 30, 1972, 47-120438; Nov. 30, 1972, 47-120439; Apr. 26, 1973, 48-48234

Int. Cl.[2] A01N *9/36*

U.S. Cl. 71—87 **8 Claims**

8. A method for killing undesirable weeds, which comprises applying to said weeds an effective amount of at least one compound selected from the group consisting of

(1) N-(O-methyl-S-n-propyldithiolphosphorylacetyl)-tetrahydroquinoline,

(2) N-(O-methyl-S-n-butyldithiolphosphorylacetyl)-tetrahydroquinoline,

(3) N-(O-methyl-S-n-pentyldithiolphosphorylacetyl)-tetrahydroquinoline,

(4) N-(O-methyl-S-n-hexyldithiolphosphorylacetyl)-tetrahydroquinoline,

(5) N-(O,S-diethyldithiolphosphorylacetyl)-tetrahydroquinoline,

(6) N-(O-ethyl-S-n-propyldithiolphosphorylacetyl)-tetrahydroquinoline,

(7) N-(O-ethyl-S-n-butyldithiolphosphorylacetyl)-tetrahydroquinoline,

(8) N-(O-ethyl-S-iso-butyldithiolphosphorylacetyl)-tetrahydroquinoline,

(9) N-(O-ethyl-S-iso-pentyldithiolphosphorylacetyl)-tetrahydroquinoline,

(10) N-(O-ethyl-S-n-pentyldithiolphosphorylacetyl)-tetrahydroquinoline,

(11) N-(O-ethyl-S-n-hexyldithiolphosphorylacetyl)-tetrahydroquinoline,

(12) N-(O-n-butyl-S-ethyldithiolphosphorylacetyl)-tetrahydroquinoline,

(13) N-(O-methyl-S-n-butyldithiolphosphorylacetyl)-hexamethylene imine,

(14) N-(O,S-diethyldithiolphosphorylacetyl)-hexamethylene imine,

(15) N-(O-ethyl-S-n-propyldithiolphosphorylacetyl)-hexamethylene imine,

(16) N-(O-ethyl-S-n-butyldithiolphosphorylacetyl)-hexamethylene imine,

(17) N-(O-ethyl-S-iso-butyldithiolphosphorylacetyl)-hexamethylene imine,

(18) N-(O-ethyl-S-sec-butyldithiolphosphorylacetyl)-hexamethylene imine,

(19) N-(O-ethyl-S-n-pentyldithiolphosphorylacetyl)-hexamethylene imine,

(20) N-(O-ethyl-S-n-hexyldithiolphosphorylacetyl)-hexamethylene imine,

(21) N-(O-n-butyl-S-ethyldithiolphosphorylacetyl)-hexamethylene imine,

(22) N-(O-ethyl-S-allyldithiolphosphorylacetyl)-hexamethylene imine,

(23) N-(O-ethyl-S-methyldithiolphosphorylacetyl)-hexamethylene imine,

(24) N-(O-ethyl-O-phenylthiolphosphorylacetyl)-tetrahydroquinoline,

(25) N-(O-ethyl-O-metatolylthiolphosphorylacetyl)-tetrahydroquinoline,

(26) N-(O-ethyl-O-orthotolylthiolphosphorylacetyl)-tetrahydroquinoline,

(27) N-(O-ethyl-O-3,5-xylenylthiolphosphorylacetyl)-tetrahydroquinoline,

(28) N-(O-ethyl-O-parachlorophenylthiolphosphorylacetyl)-tetrahydroquinoline,

(29) N-(O-n-propyl-O-phenylthiolphosphorylacetyl)-tetrahydroquinoline,

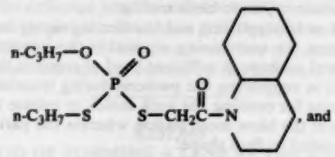
(30) N-(O-n-propyl-O-orthotolylthiolphosphorylacetyl)-tetrahydroquinoline,

(31) N-(O-n-butyl-O-phenylthiolphosphorylacetyl)-tetrahydroquinoline,

(32) N-(O-n-butyl-O-metatolylthiolphosphorylacetyl)-tetrahydroquinoline, and

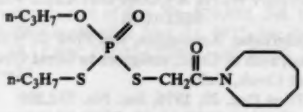
(33) N-(O-butyl-O-paraethylphenylthiolphosphorylacetyl)-tetrahydroquinoline,

(34) a compound of the formula



, and

(35) a compound of the formula



4,137,066

SULFOXIDE AND SULFONE THIAZOLIDINES, COMPOSITIONS THEREOF AND THEIR UTILITY AS HERBICIDE ANTIDOTES

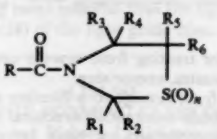
Edmund J. Gaughan, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 357,133, May 4, 1973, abandoned. This application Feb. 10, 1975, Ser. No. 548,316

Int. Cl.[2] C07D *277/04*

U.S. Cl. 71—91 **89 Claims**

1. A compound having the formula



in which R is haloalkyl having 1 to 10 carbon atoms, inclusive, and having 1–3 chloro groups or 1–2 bromo groups, n is 2, R_1 is lower alkyl having 1 to 4 carbon atoms, inclusive, R_2 is lower alkyl having 1 to 4 carbon atoms, inclusive, and R_3, R_4, R_5 and R_6 are each hydrogen.

4,137,067

PYRIDINE-4-CARBOXYLIC ACID HYDRAZIDES FOR COMBATTING PHYTOPATHOGENIC MICROORGANISMS AND FOR REGULATING PLANT GROWTH

Karl Gätzi, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

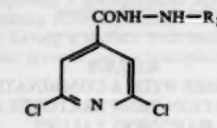
Continuation-in-part of Ser. No. 685,594, May 12, 1976, abandoned. This application Dec. 13, 1976, Ser. No. 749,864

Claims priority, application Switzerland, May 14, 1975, 06192/75; Apr. 2, 1976, 04148/76

Int. Cl.[2] A01N *9/22*; C07D *213/86*

U.S. Cl. 71—94 **18 Claims**

1. Compounds of the formula I



wherein

R_1 represents C_1–C_4-alkyl, alkyl(C_1–C_4)-carbonyl or halogenoalkyl(C_1–C_3)-carbonyl as well as salts thereof with organic and inorganic acids.

9. A method for combatting phytopathogenic microorganisms which comprises applying thereto or to the locus thereof a microbicidally effective amount of a compound as claimed in claim 1.

4,137,068

NOVEL UREAS

Jacques Perronnet, Paris; Jean-Pierre Demoute, Montreuil-sous-Bois; Pierre Girault, Paris, and André Téche, Nanterre, all of France, assignors to Roussel Uclaf, Paris, France

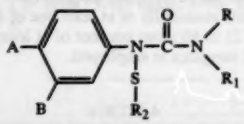
Filed Mar. 18, 1976, Ser. No. 667,992

Claims priority, application France, Mar. 26, 1975, 75 09439

Int. Cl.² A01N 9/12; C07C 119/20

U.S. Cl. 71—98 **23 Claims**

1. A compound of the formula



wherein A and B may be chlorine and when B is trifluoromethyl, A is selected from the group consisting of hydrogen and chlorine, R and R_1 are individually alkyl of 1 to 3 carbon atoms and R_2 is alkyl of 1 to 6 carbon atoms optionally substituted with a chlorine.

4,137,069

SULFIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHOD OF USE

Duane R. Arneklev, Antelope, Mont., and Don R. Baker, Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 591,257, Jun. 27, 1975, Pat. No. 4,042,371, which is a continuation of Ser. No. 394,230, Sep. 4, 1973, abandoned. This application Apr. 18, 1977, Ser. No. 788,164

Int. Cl.² A01N 9/12

U.S. Cl. 71—98 **3 Claims**

1. The method of protecting a crop selected from wheat and milo from injury due to a substituted chloroacetanilide herbicide, comprising pre-plant incorporation in the soil in which said crop is to be planted, a non-phytotoxic antidotally effective amount of a compound corresponding to the formula

$$R_1—S—R_2$$

wherein R_1 is chloroalkenyl, having 3 to 6 carbon atoms, inclusive, and R_2 is chloroalkenyl, having 3 to 6 carbon atoms, inclusive.

4,137,070

HERBICIDE COMPOSITIONS

Ferenc M. Pallos, Walnut Creek; Mervin E. Brokke, Moraga, and Duane R. Arneklev, Sunnyvale, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

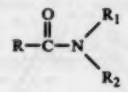
Continuation-in-part of Ser. No. 134,868, Apr. 16, 1971, abandoned. This application Dec. 9, 1971, Ser. No. 208,041

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.² A01N 9/12, 9/20

U.S. Cl. 71—100 **25 Claims**

1. A herbicidal composition comprising an active thiolcarbamate herbicide compound and an antidotally effective amount of an antidote compound having the formula



wherein R is haloalkyl containing from 1 to about 6 carbon atoms, inclusive; and R_1 and R_2 are alkenyl containing from 2 to about 12 carbon atoms, inclusive; said compound being antidotally active with said thiolcarbamate herbicide compound and wherein said compound is present in an amount varying between about 0.0001 to 30 parts by weight for each part by weight of the active herbicidal compound.

4,137,071

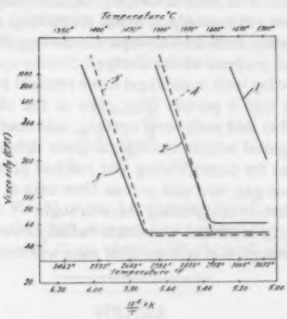
LOW COST METHOD OF FLUIDIZING CUPOLA SLAG (A)

Robert Mrdjenovich, Trenton, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1974, Ser. No. 535,545

Int. Cl.² C21B 3/02

U.S. Cl. 75—30 **4 Claims**



1. A method of fluxing slag in a basic operated cupola for making low sulfur and/or high carbon irons, by adding to the cupola charge therein an effective amount of fluxing materials comprising, by weight in the slag analysis 45–55% CaO, 9–15% MgO, 2–4% Na_2O, about 6.5% Al_2O_3, about 23–33% SiO_2, and less than 0.2% CaF_2.

4,137,072

ADDITIVE FOR USE IN REFINING IRON

Noboru Kawakami, Tokyo; Takeshi Goto, Atsugi; Itsuo Hirano, Sagamihara, and Yoichi Itakura, Musashino, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Nov. 25, 1977, Ser. No. 854,602

Claims priority, application Japan, Dec. 1, 1976, 51-143487; Dec. 1, 1976, 51-143488

Int. Cl.² C21C 7/00

U.S. Cl. 75—58 **4 Claims**

1. An additive in a molded form for use in refining iron,

comprising a mixture of 5% to 90% by weight of magnesium and 10% to 95% by weight of magnesium oxide.

4,137,073

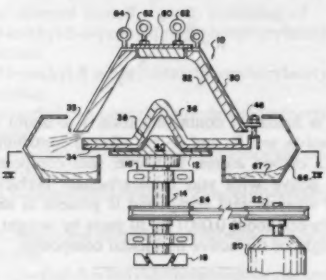
METHOD AND APPARATUS FOR TREATING ALUMINOUS METAL SKIM MATERIAL AND BY-PRODUCTS OF SAID METHOD

Ogle R. Singleton, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation-in-part of Ser. No. 642,028, Dec. 18, 1975, abandoned. This application Feb. 24, 1977, Ser. No. 771,666

Int. Cl.[2] C22B *21/00*

U.S. Cl. 75—68 R **13 Claims**



1. A method of treating hot skim material after its removal from a body of molten aluminum to separate and recover aluminum contained therein without adding a salt flux to the skim material, which comprises the steps of:

rotating a charge of said skim material in a rotatable container having at least one peripheral gap therein, said gap having a width in the range of from ¼ to 1 inch at a temperature of at least above the liquidus under conditions effective substantially to avoid thermiting, and at a speed of rotation sufficient to separate molten aluminum from residual portions of the charge;

consolidating with centrifugal force residual portions of said charge into a porous filter cake as the charge is being rotated at said peripheral opening, said container having a wall against which centrigugal force drives said residual portions for consolidating said residual portions at said at least one gap, into said porous filter cake at said gap without substantially passing therethrough;

discharging separated aluminum radially outwardly around and through said porous filter cake and through said gap.

4,137,074

NICKEL-CHROMIUM ALLOYS

Miles Firnhaber, Rte. 3, Pewaukee, Wis. 53072

Filed Apr. 17, 1978, Ser. No. 896,701

Int. Cl.[2] C22C *19/05*

U.S. Cl. 75—134 C **2 Claims**

1. An alloy consisting of the following ingredients in percentages by weight:

Ni	47.00	–	57.00
Cr	34.00	–	40.00
Cu	.05	–	.08
Fe	3.00	–	6.0
C	.18	–	.30
Si	.75	–	1.50
Mn	.10	–	.30
Co	.75	–	1.50
Mo	2.50	–	3.50

said alloy being characterized by resistance to corrosive attack by molten glass, having superior creep resistance, having strength at elevated temperatures, and imparting resistance to deformation to articles made therefrom.

4,137,075

METALLIC GLASSES WITH A COMBINATION OF HIGH CRYSTALLIZATION TEMPERATURES AND HIGH HARDNESS VALUES

Ranjan Ray, Morristown; Lee E. Tanner, Summit, both of N.J., and Carl F. Cline, Walnut Creek, Calif., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 764,661, Jan. 17, 1977, abandoned, which is a continuation of Ser. No. 495,458, Aug. 7, 1974, abandoned. This application May 25, 1977, Ser. No. 800,107

Int. Cl.[2] C22C *27/02, 27/04, 30/00*

U.S. Cl. 75—174 **14 Claims**

1. A metal alloy which is primarily glassy and has high crystallization temperature and high hardness, characterized in that the metal alloy consists essentially of

(a) about 15 to 25 atom percent of at least one metalloid selected from the group consisting of phosphorus, boron, carbon and silicon;

(b) about 20 to 40 atom percent of least one metal selected from the group consisting of nickel, chromium, iron vanadium, cobalt and aluminum, with the proviso that when the metalloid consists essentially of boron, then about 20 to 55 atom percent of at least one of iron and cobalt is employed; and

(c) about 40 to 60 atom percent of at least one refractory metal selected from the group consisting of molybdenum, tungsten, tantalum and niobium, with the proviso that when the metalloid consists essentially of boron and the metal consists essentially of at least one of iron and cobalt, then about 25 to 60 atom percent of at least one of molybdenum and tungsten is employed.

4,137,076

ELECTRICAL CONTACT MATERIAL OF TiC, WC AND SILVER

Norman S. Hoyer; Paul G. Slade, and Ram Kossowsky, all of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 24, 1977, Ser. No. 771,430

Int. Cl.[2] H01H *1/02*; B22F *5/00*

U.S. Cl. 75—241 **5 Claims**

1. A contact material comprising a skeleton of a solid-state solution alloy consisting essentially of tungsten carbide and titanium carbide in which the tungsten carbide is present within the range of about 30% and about 50% by weight of the skeleton of the contact material and the balance of the contact material comprising a metal of high heat and electrical conductivity, said latter metal being present within the range between about 10% and 90% by weight of the contact material.

5. A contact material comprising a solid-state solution alloy skeleton of refractory metal carbides and a metal of high electrical and heat conductivity interspersed within the skeletal interstices.

4,137,077

BROADENING THE SPATIAL FREQUENCY PASS BAND OF A THERMOPLASTIC LAYER

Thomas L. Credelle, East Windsor, N.J.; William J. Hannan, Palm Beach Gardens, Fla., and Fred W. Spong, Lawrenceville, N.J., assignors to RCA Corporation, New York, N.Y.

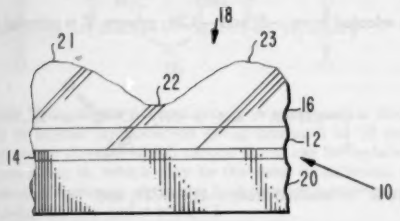
Filed Jan. 29, 1976, Ser. No. 653,288

Int. Cl.[2] G03G *16/00*

U.S. Cl. 96—1.1 **8 Claims**

1. In a holographic recording medium wherein an electrically conductive layer has first and second surfaces respectively connected to a surface of a substrate and to one surface of a photoconductor layer that is adapted to receive an inter-

ference pattern of light representative of an image, the improvement comprising a thermoplastic layer of the type that has a frost frequency inversely related to thickness, said thermoplastic layer having a surface with undulations that cause said thermoplastic layer to have a multiplicity of frost frequencies, said undulations having a spatial frequency less than any one frost frequency of said multiplicity of frost frequencies, said thermoplastic layer being disposed upon the other surface of said photoconductor layer, whereby said thermoplastic layer has a surface abutting said photoconductor layer and a free surface.



4,137,078

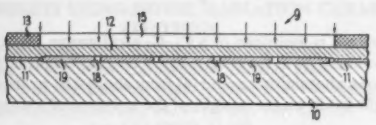
METHOD OF CONTINUOUS TONE IMAGING USING DISPERSION IMAGING MATERIAL

Masatsuga Izu, Birmingham, and Stanford R. Ovshinsky, Bloomfield Hills, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Division of Ser. No. 725,926, Sep. 23, 1976, Pat. No. 4,082,861. This application Mar. 30, 1978, Ser. No. 891,498

Int. Cl.[2] B95C *5/00*; G03C *5/16, 5/04*

U.S. Cl. 96—27 E **47 Claims**



1. The method of producing by a dry process a continuous tone image, which method comprises the step of providing a continuous tone dry process imaging film including a substrate, a solid, high optical density and substantially opaque film of a dispersion imaging material deposited on said substrate, said substantially opaque film of the dispersion imaging material, upon application of energy in an amount sufficient to increase the absorbed energy in the material above a certain critical value, being capable of changing to a substantially fluid state in which the surface tension of the material acts to cause the substantially opaque film where subject to said energy to disperse and change to a discontinuous film comprising openings and deformed material which are frozen in place following said application of energy and through which openings light can pass, and means associated with said film of imaging material for retarding the change to the discontinuous film, caused by the surface tension, and for controlling the amount of such change in accordance with the intensity of the applied energy above said certain critical value to increase the amount of said change and the area of the openings in the film and decrease the area of the deformed material in the film and, therefore, the optical density of the film in accordance with the intensity of the applied energy above said certain critical value for providing continuous tone imaging of the dry process imaging film, the step of applying to said substantially opaque film of dispersion imaging material energy in an amount sufficient to increase the absorbed energy in the material above said certain critical value to disperse and change the same, where subjected to said applied energy, to a discontinuous film comprising openings and deformed material which are frozen in place following said application of energy and through which openings light can pass, and controlling the intensity of the applied energy above said certain critical value to control the amount of such change in accordance with the intensity of the applied energy above said certain critical value to increase the amount of said change and the area of the openings in the film and decrease the area of the deformed material in the film and, therefore, the optical density of the film in accordance with the intensity of the applied energy above said certain critical value for continuous tone imaging of the dry process imaging film.

4,137,079

ANTIFOGGANTS IN HEAT DEVELOPABLE PHOTOGRAPHIC MATERIALS

Conrad G. Houle, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 3, 1978, Ser. No. 892,594

Int. Cl.[2] G03C *7/00, 1/40, 1/02, 1/34*

U.S. Cl. 96—55 **35 Claims**

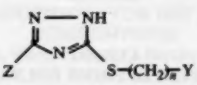
34. A process of developing a dye enhanced silver image in an exposed heat developable photographic element comprising a support having thereon, in binder, in reactive association,

(a) photosensitive silver halide,

(b) a dye-forming coupler,

(c) an oxidation-reduction image-forming combination comprising

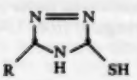
(i) a 3-amino-1H-1,2,4-triazole silver salt oxidizing agent consisting essentially of a silver salt of a 3-amino-1H-1,2,4-triazole represented by the structure



wherein Y is aryl containing 6 to 12 carbon atoms; *n* is 0 to 2; and Z is hydrogen, hydroxyl or amine, with

(ii) an organic reducing agent which in its oxidized form forms a dye with a dye-forming coupler, and

(d) an antifoggant concentration of a 5-mercapto-1,2,4-triazole represented by the formula:



wherein R is H or alkyl containing 1 to 3 carbon atoms, comprising heating said element to a temperature within the range of about 120° C. to about 185° C. until said image is developed.

4,137,080

PROCESS FOR DYE IMAGE PRODUCTION ON A LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Mitsuto Fujiwhara; Syunji Matsuo; Mikio Kawasaki; Yutaka Kaneko, and Toyoaki Masukawa, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 739,330, Nov. 5, 1976, abandoned. This application Apr. 26, 1978, Ser. No. 899,893

Claims priority, application Japan, Nov. 7, 1975, 50-133879

Int. Cl.[2] G03C *7/00, 5/30*

U.S. Cl. 96—55 **3 Claims**

1. A process for the production of a dye image on a light-sensitive silver halide photographic material which comprises imagewise exposing said material to light and developing said material in the presence of both a polyfunctional coupler selected from the group consisting of Resorcin, 2,2'-Dihydroxybiphenyl, 5-Amino-α-naphthol, N,N'-Bis(3-hydroxyphenyl)ethylenediamine, 1-Phenyl-3-(1-hydroxy-2naphthamido)-

pyrazolin-5-one, N,N'-Bis[1-(4-sulfophenyl)-pyrazolin-5-one-3-yl]-malondiamide, α-Acetyl-3-hydroxyacetoanilide, N,N'-Methylenebis(1-hydroxy-2-naphthamide), 2,2'-Methylenebis(8-hydroxyquinoline), 2,2'-Methylenebis[6-(2-hydroxyphenyl)phenol], N,N'-Bis[2-hydroxy-4-(2',4'-di-tert.-amylphenoxy acetamido)phenyl]malondiamide, 2,2'-Methylenebis(4-chlorophenol), 3,3'-Diphenylamine, 3-Aminophenol, 3-Anilinophenol, 3-(N-Methyl)aminophenol, and a compound selected from the group consisting of N,N'-Ethylenebis(3-methyl-4-amino-N-methylaniline), β,β'-Oxybis[β-(N-ethyl-4-aminoanilino)ethyl]ether, N,N'-Ethylenebis[4-amino-N-(β-hydroxyethyl)aniline], 4-Amino-N-ethyl[β-(4'-amino-N'-ethylanilino)propionic acid]anilide, 2,2'-Methylenebis(p-phenylenediamine), 2-Amino-5-[N-ethyl-N-(β-methoxyethyl)]amino-phenethyl{2-amino-5-[N-ethyl-N-(β-methoxyethyl)]}-aminobenzylsulfonamide, N[2-(N,N-diethylamino)-5-aminophenethyl]-2-amino-5-(N,N-diethylamino)-phenylaniline, 2-[β-{2-amino-5-(N,N-diethylamino)phenoxy}ethyl]-4-amino-N,N-diethylaniline, Bis(2-hydroxy-5-aminobenzyl)amine, 2,2'-Methylenebis(p-aminophenol), N-(2'-hydroxy-5'-aminophenyl)-2-hydroxy-5-amino-benzylamine, α,α'-(Ethylenediimino)-bis-(4-amino-o-cresol), 3-Methyl-4-amino-N-ethyl-N-(2-hydroxy-5-aminobenzyl)aniline, α,α'-Oxybis(4-amino-o-cresol), 5-Aminosalicylic acid (2-amino-5-hydroxy)anilide, 2,2'-Disulfidebis(p-aminophenol), 2,6-Bis(2-hydroxy-3-methyl-5-aminobenzyl)-3,5-dimethyl-4-amino-phenol.

4,137,081

PRINTING PLATES FROM POLYMER WITH TERMINAL UNSATURATION

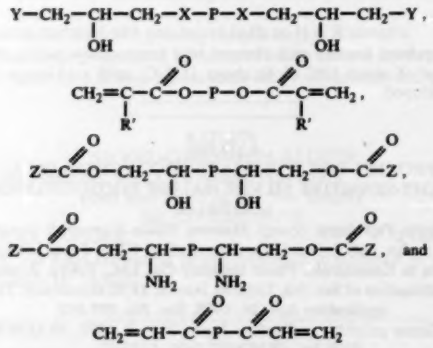
Rudolph L. Pohl, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 628,862, Nov. 5, 1975, abandoned. This application Jun. 27, 1977, Ser. No. 810,334

Int. Cl.[2] G03C *1/78, 1/96, 1/68, 5/00*

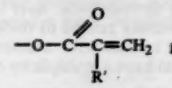
U.S. Cl. 96—87 R **10 Claims**

1. A photopolymer composition comprising (1) a liquid terminal olefinically unsaturated linear polymer having a molecular weight in the range of from 1,000 to 20,000, selected from polymers having the structure



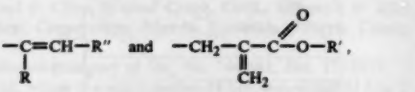
where X is selected from —O—, —S—,

and —NH— groups; Y is selected from —O—CH$_2$—CH=CH$_2$ and

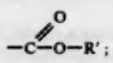


groups;

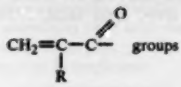
R' is selected from —H and —CH$_3$ groups; Z is selected from



where R'' is selected from —H, —CH$_3$ and



and P is a polymer residue selected from homopolymers of butadiene, isoprene, chloroprene, styrene, isobutylene, ethylene, and copolymers of butadiene with acrylonitrile, butadiene with styrene, butadiene with isoprene, ethylene with neohexene, isobutylene with styrene, isobutylene with acrylonitrile, and the corresponding saturated residues; (2) from about 1 to about 50% by weight based on the weight of the polymer of at least one ethylenically unsaturated monomer selected from acrylonitrile, methacrylonitrile, styrene, methyl substituted styrene, N-vinyl pyrrolidone, and monomers containing one or more



groups

wherein R is hydrogen or a C$_1$–C$_3$ alkyl group; (3) from about 0.1 to about 10% by weight based on the weight of the polymer of a photoinitiator; and (4) from about 0.01 to about 2% by weight based on the weight of the polymer of a stabilizer.

4,137,082

PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL HARDENED WITH A VINYLSULFONYL COMPOUND

Hidefumi Sera; Tsumoru Ishii; June Yamaguchi, and Hisashi Shiraishi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

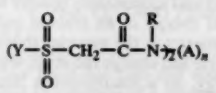
Filed Sep. 27, 1977, Ser. No. 837,248

Claims priority, application Japan, Sep. 27, 1976, 51-115611

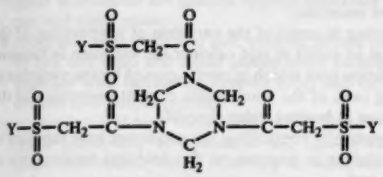
Int. Cl.[2] G03C *1/30*

U.S. Cl. 96—111 **6 Claims**

1. A photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer, with at least one hydrophilic colloid layer thereof containing (a) gelatin and/or a gelatin derivative and (b) 0.1 to about 10 wt% based on the weight of dry gelatin or derivative of at least one compound represented by the following general formula (I) or (II):



(I)



(II)

wherein Y represents a vinyl group; A represents a divalent cyclic or acyclic hydrocarbon group having 1 to 10 carbon atoms, one to three of which carbon atoms can be replaced by a hetero atom; R, which may be the same or different, each represents a hydrogen atom or a hydrocarbon group having 1 to 4 carbon atoms; and *n* is 0 or 1.

4,137,083

WATER BASED PRINTING INK

Ross M. Hedrick, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 687,413, May 17, 1976, Pat. No. 4,072,644. This application Nov. 18, 1977, Ser. No. 852,641

Int. Cl.[2] C09D *11/00*

U.S. Cl. 106—20 **12 Claims**

1. A printing process wherein a fast drying protective overcoat is applied over a slow drying ink, the improvement wherein said overcoat is an aqueous based solution comprising water and a polymer solubilized in said water by a rapid removable solubilizing component, said polymer being capable of forming a water-insensitive gel film upon removal of said rapid removable solubilizing component.

4,137,084

PROCESS FOR PRODUCING PRESSURE-SENSITIVE COPY SHEETS USING NOVEL RADIATION CURABLE COATINGS

Gerald T. Davis, and Dale R. Shackle, both of Chillicothe, Ohio, assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 684,462, May 7, 1976, Pat. No. 4,091,122. This application Aug. 24, 1977, Ser. No. 827,124

Int. Cl.[2] C09D *11/00*

U.S. Cl. 106—21 **5 Claims**

1. A liquid chromogenic coating composition, said coating composition being characterized as substantially solvent-free and comprising a chromogenic material and a liquid radiation curable substance, said chromogenic material being a color developer of the acidic electron accepting type, said coating composition and said radiation curable substance being compatible with the color forming characteristics of said color developer, said radiation curable substance including one or a mixture of ethylenically unsaturated organic compounds having at least one terminal ethylenic group per molecule, said liquid chromogenic coating composition being radiation curable by free radical polymerization to a solid tack-free resin.

4,137,085

GREEN SAND COMPOSITION FOR CASTING

Hirofumi Matsui, No. 6-16, 2-chome, Higashi, Shibuya-ku, Tokyo, Japan

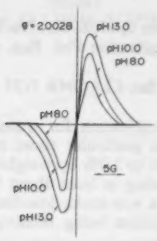
Filed Apr. 6, 1977, Ser. No. 785,312

Claims priority, application Japan, Apr. 8, 1976, 51-40047

Int. Cl.[2] B28B *7/34*

U.S. Cl. 106—38.35 **19 Claims**

1. A green sand composition for casting comprising a green sand composed of siliceous sand, bentonite, and water, and having incorporated therein a component selected from the group consisting of (a) waste liquor of a pH of 9 to 13 obtained in the soda process, kraft process, or oxygen-alkali cooking process for preparing pulps from woods or non-wooden raw materials, or a concentrate or powder formed from said waste liquor, (b) a waste liquor of a pH of 9 to 13 obtained by cooking a wood or non-wooden material with a liquid mixture or sodium sulfite with sodium hydroxide or sodium carbonate, or a concentrate or powder prepared from said waste liquor, (c) a mixture of a solution of an alkali lignosulfonate having a pH of 9 to 13 with a monosaccharide or polysaccharide or a monosaccharide- or polysaccharide-containing residue left after removing thiolignin from a kraft pulp waste liquor, the mixing ratio being in the range of 30/70 to 70/30 based on the solids, and (d) a mixture of at least two components selected from said components (a), (b) and (c), the amount incorporated of said component (a), (b), (c) or (d) as the solids thereof being at least 0.1% by weight based on the siliceous sand.



4,137,086

GLASS COMPOSITIONS FOR USE IN CURABLE COMPOSITIONS

William D. Potter, Ware; Andrew C. Barclay, Harlow; Reginald Dunning, Parbold, and Richard J. Parry, Southport, all of England, assignors to Pilkington Brothers Limited, St. Helens Merseyside, England

Continuation of Ser. No. 685,485, May 11, 1976, abandoned. This application Nov. 17, 1977, Ser. No. 852,280

Claims priority, application United Kingdom, May 13, 1975, 20196/75; May 13, 1975, 20197/75; Aug. 15, 1975, 34128/75

Int. Cl.[2] C03C *3/04*

U.S. Cl. 106—52 **19 Claims**

1. A calcium fluoroaluminosilicate glass consisting essentially of from 25 to 35% by weight of silicon calculated as silica, from 30 to 40% by weight of aluminum calculated as alumina, from 20 to 35% by weight calcium, calculated as calcium oxide, and up to 9% by weight fluorine.

4,137,087

CURABLE COMPOSITIONS COMPRISING AQUEOUS SOLUTIONS OF WATER-SOLUBLE SILICATES AND WATER-SOLUBLE LATENT INSOLUBILIZING AGENTS

John E. Blasko; William G. Boberski, both of Gibsonia, and Jerome A. Seiner, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 11, 1976, Ser. No. 740,983

Int. Cl.[2] C09D *1/04*

U.S. Cl. 106—84 **20 Claims**

1. Curable coating compositions comprising aqueous solutions of water-soluble silicates and a water-soluble latent insolubilizing agent formed from Al^{+++} ions and ligands selected from the group consisting of ethylenediaminetetraacetate, diethylenetriaminepentaacetate, N-(hydroxyethyl)-ethylenediaminetriacetate, nitrilotriacetate and 1,3-propanediaminetetraacetate; wherein said insolubilizing agent is stable at a pH of greater than 7.0, and wherein the amounts of said insolubilizing agent included in said compositions are sufficient to enhance the wet abrasion and water resistance of the cured compositions, as measured by soaking a cured coating on a glass panel in water and rubbing the surface of the coating with a water soaked cloth at least 130 double finger

rubs without abrading the surface, but insufficient to cause package instability in the uncured compositions.

4,137,088

PLASTICIZER COMBINATION FOR BUILDING MATERIALS

Gerhard Debus, Assmannshausen, and Volker Knittel, Wiesbaden, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Feb. 2, 1978, Ser. No. 874,699

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1977, 2704929

Int. Cl.[2] C04B 7/35

U.S. Cl. 106—90 8 Claims

1. An additive combination for water containing, setting building materials, in particular those of cement, based on about 0.1% by weight to 3.0% by weight of an anionic polyelectrolyte, and including at least about 0.05% by weight to 1.0% by weight of a non-ionic, low-foaming surfactant, all percent by weight values being relative to a binder in the building material.

4,137,089

PROCESS FOR PRODUCING HYDRAULIC BINDERS AND BINDERS OBTAINED

Marcel Arnould, Bourg La Reine; Roger Struillou, Villeron, Yvette, and Jack Roger, Chartres, all of France, assignors to Association pour la Recherche et le Developpment des Methodes et Processus Industriels (A.R.M.I.N.E.S.), Paris, France

Filed Mar. 18, 1977, Ser. No. 756,007

Int. Cl.[2] C04B 7/36

U.S. Cl. 106—100 15 Claims

1. A process for the production of a hydraulic binder comprising essentially a mixture of calcium and silicon oxides, which process comprises:

adding to a mixture of starting compounds for the preparation of hydraulic binders which starting compounds contain oxygen, calcium and silicon, at least one disturbing agent selected from the group consisting of calcium sulphate and sodium sulphate, said agent being capable of modifying the crystallinity of silicate normally formed by the firing of said mixture of starting compounds at a high temperature, firing said mixture containing said disturbing agent at a temperature between 600° and 950° C., and recovering a silicate possessing hydraulic properties.

4,137,090

METHOD FOR CONTROLLING OPERATION OF APPARATUS FOR PREHEATING AND CALCINING CEMENT MATERIALS CONTAINING COMBUSTIBLE MATERIALS

Norio Nakamura, Omiya; Satoshi Tominaga, Tama; Tsuneo Kobayashi, Ichikawa, and Mitsuo Nagaoka, Higashikurume, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Mar. 30, 1977, Ser. No. 782,756

Claims priority, application Japan, Apr. 6, 1976, 51-37840

Int. Cl.[2] C04B 7/02

U.S. Cl. 106—106 2 Claims

1. A method for controlling the operation of an apparatus for preheating and calcining cement materials containing combustible materials comprising the steps of:

(a) preheating noncombustible cement materials in a preheater and then introducing the preheated materials into a calciner,

(b) introducing combustible cement materials into the calciner in such a quantity that the heating value of the combustible cement materials may be less than the heat required for the complete preheating and calcining of both cement materials,

(c) burning the combustible materials in the cement materials and supplying additional heat to said calciner in an amount required for the complete preheating and calcining of both cement materials,

(d) detecting in terms of the variation of temperature of the gases at an outlet of said calciner the variation in required calcination heat which in turn is caused by the variation in mixing ratio of the combustible cement materials and the variation in heating value thereof,

(e) automatically controlling the additional heat supplied to said calciner in response to the detected temperature of gases, and

(f) introducing the calcined material into the kiln and burning the material introduced therein to form cement clinker.

4,137,091

IMPREGNATING AGENT FOR CAMOUFLAGE

Horst Hanisch, Niederkassel-Rheidt; Karl-Martin Rödder, and Hansjürgen Hass, both of Troisdorf-Spich, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Bezirk Cologne, Germany

Filed Feb. 25, 1977, Ser. No. 772,057

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1976, 2608668

Int. Cl.[2] C09K 3/00, 3/18

U.S. Cl. 106—287.16 4 Claims

1. A camouflage impregnating agent for an oxidic surface comprising a silver salt dissolved in an alcoholic solution of a C_{1-8} alkyl trialkoxysilane.

4,137,092

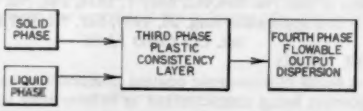
DISPERSION OR SUSPENSION OF SOLID PHASE IN LIQUID PHASE

Edward H. Cumpston, 43 Monument Ave., Old Bennington, Vt. 05201

Filed Feb. 6, 1976, Ser. No. 655,990

Int. Cl.[2] C09C 3/04, 1/42

U.S. Cl. 106—288 B 4 Claims



1. A method of dispersing or suspending a solid phase in a liquid phase by using a mixer having a mixing region arranged so said phases enter an input region of said mixing region, move through said mixing region, and exit from an output region of said mixing region, said solid and liquid phases being continuously fed into said input region of said mixing region, and said method comprising:

a. establishing the relative input rates for said solid and liquid phases so that the combination of said phases in said input region continuously forms a substantially non-flowable third phase extending from said input region toward said output region and having a plastic consistency thick enough to receive and hold subsequently input material and prevent any direct passage of material through said mixing region until said solid and liquid phases are homogeneously mixed together, and said plastic-consistency third phase also being thick enough to produce high mixing shear in response to working by said mixer;

b. shearing said plastic-consistency third phase with an element moving in said mixing region to apply discrete and rapidly occurring high shear increments to said plastic-consistency third phase;

c. using said high shear to work said plastic consistency third phase about within said mixing region so that all of said third phase encounters said moving element and said high

shear increments are quickly applied uniformly throughout said third phase;

d. using said high shear and said working of said third phase to mix said solid and liquid phases more homogeneously together with increasing distance from said input region toward said output region;

e. continuing said high shear and said working of said third phase sufficiently to transform said non-flowable third phase continuously into a relatively flowable fourth phase before said third phase reaches said output region, said fourth phase being a uniform dispersion or suspension of said solid phase in said liquid phase; and

f. separating said fourth phase continuously from said third phase and continuously moving said fourth phase away from said third phase and through said output region without mixing said fourth phase back into said third phase.

4,137,093

SETTING RETARDING COMPOSITION FOR WELL CEMENTING AND RECEMENTING

Raul Poblano, Mexico City, Mexico, assignor to Instituto Mexicano del Petroleo, Mexico City, Mexico

Filed Jul. 11, 1977, Ser. No. 814,663
Claims priority, application Mexico, Jul. 26, 1976, 165645
Int. Cl.[2] C04B *13/22, 13/24*
U.S. Cl. 106—315 **4 Claims**

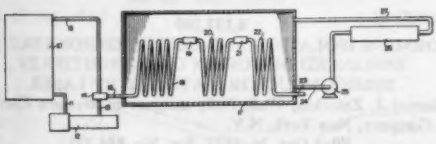
1. An improved setting retarding composition for cementing and recementing of wells, which comprises: from 13 to 17% by weight of carboxymethyl cellulose, from 20 to 23% by weight of sodium tetraborate, from 25 to 27% by weight of dextrine; characterized in that it also contains from 35.0 to 40% by weight of boric acid.

4,137,094

CONTINUOUS PRODUCTION OF STARCH HYDROLYSATES

John F. Hughes, 91 Davignon, Dollard des Ormeaux, Quebec, Canada

Continuation of Ser. No. 767,794, Feb. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 667,170, Mar. 15, 1976, abandoned. This application Jan. 12, 1978, Ser. No. 868,921
Int. Cl.[2] C13K *1/06*
U.S. Cl. 127—38 **8 Claims**



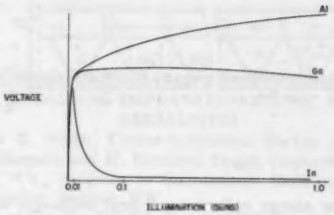
1. A process for producing starch hydrolysates comprising continuously moving an aqueous acidic starch slurry feed containing at least about 35% by weight starch solids through a confined preheat zone at a pressure of at least 300 psi to raise the temperature of the slurry to at least 140° C., continuously forcing the hot fluid mass emerging from the preheat zone through an elongated compressing zone, said elongated compressing zone having a cross-sectional area less than 25% of the cross-sectional area of the preheat zone and a length:diameter ratio of at least 4:1, continuously receiving material emerging from the compressing zone in the form of a fine spray or mist including water vapor in a confined zone of reduced pressure and continuously collecting from said reduced pressure zone a homogeneous starch syrup having a higher solids content than the starch slurry feed, the temperature and pressure within the compressing zone being selectively controlled to provide syrup products of predetermined DE values.

4,137,095

CONSTANT VOLTAGE SOLAR CELL AND METHOD OF MAKING SAME

Joseph Lindmayer, Bethesda, Md., assignor to Solarex Corporation, Rockville, Md.

Continuation-in-part of Ser. No. 705,063, Jul. 14, 1976, Pat. No. 4,056,879, which is a division of Ser. No. 614,619, Sep. 18, 1975, Pat. No. 3,990,097. This application May 9, 1977, Ser. No. 795,012
Int. Cl.[2] H01L *21/225*
U.S. Cl. 136—89 SG **10 Claims**



1. A method of forming a silicon solar energy cell capable of maintaining a substantially constant voltage during exposure to significant increases in illumination, comprising heating a silicon wafer having at least one major surface with a diffusant-/impurity to form an electrical junction inwardly of said major surface and a film of diffusant glass on said surface, applying a coating of gallium to the glass film, and then heating the wafer at a temperature and for a time sufficient to enable the gallium to penetrate the glass film, negate the polarity of the junction and form a gallium junction in its stead.

4,137,096

LOW COST SYSTEM FOR DEVELOPING SOLAR CELLS

Henry B. Maier, 6 Sealey Ave., Hempstead, L. I., N.Y. 11550

Filed Mar. 3, 1977, Ser. No. 773,914
Int. Cl.[2] H01L *31/04;* C25D *11/00*
U.S. Cl. 136—89 TF **7 Claims**

1. A method of making a solar cell comprising electroplating an aluminum or aluminum alloy substrate with a flash coating of iron, leaving a contact portion thereof uncoated, cathodically electrolytically treating said coated substrate in a photographic hypo or other thiosulfate containing bath to convert a portion of said iron coating to iron sulfide, applying an aluminum contact to a portion of said iron sulfide layer, and drying said coated substrate sufficiently to yield a solar cell which generates a photovoltage and photocurrent upon exposure to radiant energy.

2. A solar cell comprising an aluminum substrate having an electrodeposited layer of iron thereon, a conversion coating of iron sulfide formed on said iron layer, and an aluminum contact to a portion of the surface of said iron sulfide layer.

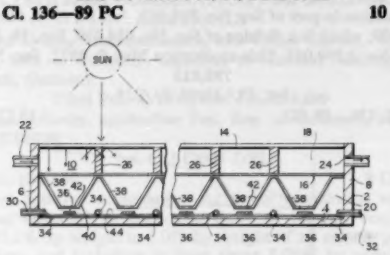
3. A method of making an electroresponsive cell comprising electroplating an aluminum or aluminum alloy substrate with a metallic flash coating, leaving a contact portion thereof uncoated, cathodically electrolytically treating said coated substrate in a bath comprising photographic hypo or other thiosulfate containing bath, to form the electroresponsive coating thereon by the said electrolytic action, and then applying a metallic contact to a portion of said electroresponsive layer, and drying said coated substrate sufficiently to yield an electroresponsive cell which generates a voltage and current upon excitation by solar or radiant energy.

4. An electroresponsive cell comprising an aluminum substrate having an electrodeposited layer comprising iron thereon, a conversion coating comprising iron sulfide formed on said electrodeposited layer, and a metal contact to a portion of the surface of said sulfide layer.

4,137,097
SOLAR ENERGY ASSEMBLY

Joseph E. Kelly, 508 Island St., LaCrosse, Wis. 54601

Filed Aug. 15, 1977, Ser. No. 824,428
Int. Cl.[2] H01L *31/04;* F24J *3/02*
U.S. Cl. 136—89 PC 10 Claims

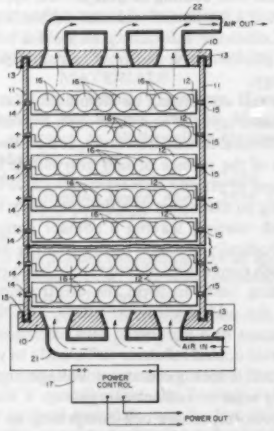


1. A solar energy collector and heat exchanger assembly comprising a housing having a bottom wall and upstanding side walls, a transparent top disposed on said housing, a transparent wall disposed in said housing in a plane parallel to the plane of said top, said transparent wall being about its entire periphery adjacent inner surfaces of said upstanding side walls, whereby to divide said housing into upper and lower chambers, said upper chamber having an air inlet and an air outlet, said lower chamber having a liquid inlet and a liquid outlet interconnected by a conduit extending through said lower chamber, photo cells disposed in said lower chamber and adapted to provide heat to said conduit, and reflective means disposed in said lower chamber for directing sunlight to said photo cells and for reflecting sunlight toward said upper chamber.

4,137,098
SOLAR ENERGY WINDOW

Richard L. Field, Gaithersburg, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 20, 1977, Ser. No. 843,760
Int. Cl.[2] H01L *31/04;* F24J *3/02*
U.S. Cl. 136—89 PC 12 Claims



1. A solar energy window, comprising:
a. a window frame;
b. a plurality of parallel slats pivotally mounted within said frame for rotation about their longitudinal axis;
c. a plurality of photovoltaic cells mounted on each of said slats; the photovoltaic cells on each of the slats being electrically connected together to provide a desired voltage when excited to generate electricity;
d. means for electrically connecting together the electrical output from each of the slats of photovoltaic cells to achieve a desired electrical power level to be used as an electrical source of power;
e. a pair of transparent window panels mounted on said frame, one to the fore and one to the aft of said plurality of said slats thereby completely enclosing said slats within said frame and between said transparent window panels, said transparent window panels being operable to allow solar energy to pass therethrough and impinge upon the photovoltaic cells on said slats when said slats are positioned at an angle for said photovoltaic cells to receive said solar energy;
f. means for providing an airflow through said frame, between said transparent window panels and over said slats for cooling said photovoltaic cells and for collecting heat from the solar energy window assembly.

4,137,099
METHOD OF CONTROLLING LEAKAGE CURRENTS AND REVERSE RECOVERY TIME OF RECTIFIERS BY HOT ELECTRON IRRADIATION AND POST-ANNEALING TREATMENTS

Yen S. E. Sun, Los Altos, Calif., assignor to General Electric Company, Auburn, N.Y.

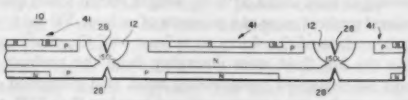
Filed Jul. 11, 1977, Ser. No. 814,405
Int. Cl.[2] H01L *21/263*
U.S. Cl. 148—1.5 14 Claims

1. A method for making a high speed semiconductor rectifier characterized by low leakage current and short reverse recovery time comprising the steps of:
fabricating a rectifier;
heating said rectifier to a temperature of about 300° C.;
irradiating said rectifier while maintaining the temperature of said rectifier at about 300° C.; and then
annealing said rectifier at a temperature of between about 280° and 350° C. for a time between about two and about ten hours selected to decrease the leakage current while at the same time increasing the reverse recovery time by a relatively lesser amount.

4,137,100
FORMING ISOLATION AND DEVICE REGIONS DUE TO ENHANCED DIFFUSION OF IMPURITIES IN SEMICONDUCTOR MATERIAL BY LASER

Vincent J. Zaleckas, Wall, N.J., assignor to Western Electric Company, New York, N.Y.

Filed Oct. 26, 1977, Ser. No. 846,221
Int. Cl.[2] B23K *27/00;* H01L *21/268*
U.S. Cl. 148—1.5 12 Claims



7. A process for diffusing a dopant into a semiconductor wafer to form an isolation region therein, comprising the steps of:
(a) growing an oxide coating on at least one major surface of the wafer;
(b) directing a laser beam at the oxide coated wafer to form an excavation in the wafer and simultaneously remove portions of the oxide coating thereabove;

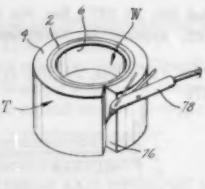
(c) depositing the dopant on the oxide coated wafer to coat the oxide and fill the excavation; and

(d) heating the wafer for a first time period at a temperature sufficient to diffuse the dopant in the excavation into the wafer to a first predetermined depth.

4,137,101
APPARATUS AND METHOD FOR REMOVING TIRES FROM WHEELS

Harold R. Stock, Overland, Mo., assignor to Wiese Planning and Engineering, Inc., St. Louis, Mo.

Filed Feb. 1, 1978, Ser. No. 874,112
Int. Cl.² B60C *25/00*; B23K *7/00*
U.S. Cl. 148—9 R **19 Claims**

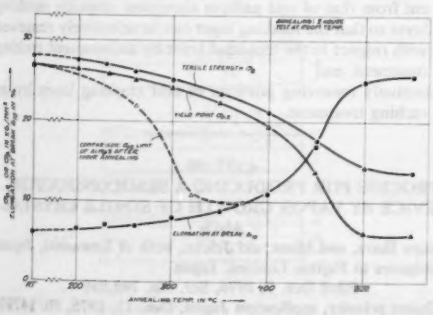


1. An apparatus for cutting a transverse groove through the solid tread of a tire so as to provide easier access to a rim underlying the tread, said apparatus comprising: a base configured to support a tire thereon; cutting means for cutting the tread of the tire; and force imparting means for causing relative movement between tire and the cutting means such that the cutting means passes through the tread of the tire, but not the rim, and cuts a transverse groove therein.

4,137,102
ALUMINUM ALLOY PRODUCTS OF HIGH CORROSION RESISTANCE AND DEFORMABILITY

Jürgen Althoff, Oberursel; Kurt Jäger, Rodheim v.d.H.; Heinz Lommel, Neu-Anspach; Manfred Möller, Bad Vilbel, and Manfred Pötzschke, Kronberg, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jun. 29, 1976, Ser. No. 700,781
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529064; Dec. 8, 1975, 2555095
Int. Cl.² C22C *21/00*
U.S. Cl. 148—31.5 **10 Claims**



1. A part subject to corrosion which is constituted of a wrought aluminum alloy which is composed, on a weight basis, of

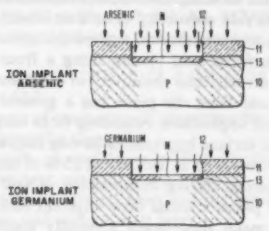
0.8 to 2.2% manganese
0.1 to 0.5% zirconium
0.2 to 0.7% iron
0.2 to 0.6% silicon
0 to 0.5% copper
0 to max. 0.1% magnesium
balance aluminum and inevitable impurities which are due to the manufacture, said alloy having been subjected after casting to a temperature of 450° C. to 500° C. for a period of 5 to 10 hours and hot and cold working so as to have the characteristics of good deformability, resistance to corrosion, and a recrystallization temperature above 400° C.

2. The part defined in claim 1 wherein said wrought aluminum alloy contains zirconium in a range of 0.1 to 0.35% by weight, said part being a kitchen utensil coated with vitreous enamel and resistant to corrosion and having a high buckling strength.

4,137,103
SILICON INTEGRATED CIRCUIT REGION CONTAINING IMPLANTED ARSENIC AND GERMANIUM

Siegfried R. Mader, Croton-on-Hudson; Burton J. Masters, Poughkeepsie, and H. Bernhard Pogge, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 748,035, Dec. 6, 1976, Pat. No. 4,011,719.
This application May 22, 1978, Ser. No. 908,322
Int. Cl.² H01L *21/265, 21/203*
U.S. Cl. 148—33 **3 Claims**



1. A silicon substrate having formed therein an ion implanted N conductivity-type region comprising arsenic atoms having a concentration of at least 1×10^{-2} As atoms/total atoms in substrate, and implanted germanium atoms.

4,137,104
AS-ROLLED STEEL PLATE HAVING IMPROVED LOW TEMPERATURE TOUGHNESS AND PRODUCTION THEREOF

Hajime Nashiwa, Sakai; Akiyoshi Mori, and Yoshiyasu Kitagawa, both of Wakayama, all of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Feb. 14, 1977, Ser. No. 768,042
Claims priority, application Japan, Feb. 23, 1976, 51-18658
Int. Cl.² C22C *38/08*
U.S. Cl. 148—36 **7 Claims**

1. An as-rolled steel plate having improved low temperature toughness, which consists essentially of:

C: 0.03 – 0.55% by weight
Si: 0.02 – 0.50% by weight
Mn: 0.30 – 2.00% by weight
P: not greater than 0.025% by weight
S: not greater than 0.010% by weight
Ni: 0.8 – 2.0% by weight
Ca: 0.0005 – 0.004% by weight
Nb: 0 – 0.05% by weight
V: 0 – 0.10% by weight
Sol. Al: not greater than 0.080% by weight
Calcium/sulfur weight ratio: 0.05 – 1.50

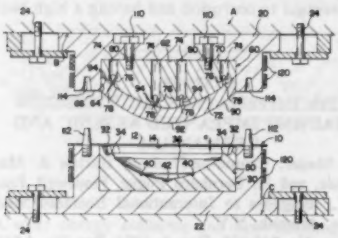
said amounts of Ca and Ni serving to reduce the formation of bainite phase during low temperature rolling and making it possible for use of said plate as a pipe line material in the as-rolled state

Fe: balance.

4,137,105
METHOD OF FORMING TOOLING FOR SUPERPLASTIC METAL SHEET

Martin E. Ness, Weston, Conn., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Jun. 20, 1977, Ser. No. 807,924
Int. Cl.² C22F 1/18
U.S. Cl. 148—11.5 R 24 Claims



1. A method of forming a back die piece for use in a system for compression molding thin superplastic sheets of the type having a strain rate sensitivity of at least about 0.3 at an elevated forming temperature and a given thickness between first and second surfaces, said system using a front die piece of metal having a strain rate sensitivity of substantially less than 0.2 wherein said front die piece has a general contour and discrete surface impressions extending from said general contour, with said surface impressions having displacements from said general contour of at least about 25% of said sheet thickness and requiring, during compression of said sheet against said front die piece, a metal flow adjacent said second sheet surface, said metal flow being generally transverse to said general contour, said method comprising the steps of:

(a) providing a back die piece formed from a mass of superplastic metal having a strain rate sensitivity of at least about 0.3 at an elevated forming temperature;

(b) heating said back die piece to said elevated forming temperature;

(c) placing one of said sheets over said front die;

(d) forcing said back die piece toward said sheet and said front die piece until said sheet flows completely into said surface impressions; and,

(e) causing said sheet to be heated to an elevated temperature at least during said forcing step.

4,137,106
SUPER HARD METAL ROLL ASSEMBLY AND PRODUCTION THEREOF

Yoshihiko Doi; Yasuhiro Saito; Mitsunori Kobayashi, and Seiki Hirsoka, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jul. 26, 1976, Ser. No. 708,759
Int. Cl.² B22F 7/02
U.S. Cl. 148—126 5 Claims

1. A process of producing a cemented carbide roll assembly comprising:

moulding a powdered mix of cemented carbide-forming materials into a hollow cylindrical moulding,

placing the hollow cylindrical moulding concentrically about a cylindrical cemented carbide element in a manner such as to provide a space between the inner periphery of the hollow cylindrical moulding and the outer periphery of the cylindrical cemented carbide element,

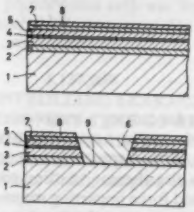
sintering the resultant assembly at a temperature from 1,250° to 1,500° C., thereby contracting the hollow cylindrical moulding and generating a liquid phase to effect integral engagement between the hollow cylindrical moulding and the cylindrical cemented carbide element, and

heat-treating the resultant roll assembly in an inert gas at a temperature from 1,200° to 1,500° C., under a pressure of 20 to 2,000 atm so as to eliminate voids between the sintered moulding and the cylindrical cemented carbide element.

4,137,107
METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE UTILIZING SELECTIVE MASKING, DEPOSITION AND ETCHING

Willem Nijman, and Peter J. de Waard, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,312
Claims priority, application Netherlands, Aug. 30, 1976, 7609607
Int. Cl.² H01L 21/308, 21/208
U.S. Cl. 148—171 3 Claims



1. A method of manufacturing a semiconductor device which comprises:

providing a semiconductor substrate having a major surface;

forming an epitaxial system of layers on said major surface in a first epitaxy process by forming a plurality of epitaxial layers on said major surface, forming a gallium arsenide contact layer on said plurality of layers and forming a gallium aluminum arsenide masking layer on said contact layer;

locally removing said epitaxial system of layers down to said major surface at selected locations to expose selected portions of said major surface;

selectively forming a localized layer of gallium aluminum arsenide on the exposed portions of said major surface in a second epitaxy process, the composition of said localized gallium aluminum arsenide layer being sufficiently different from that of said gallium aluminum arsenide masking layer so that the masking layer can be selectively removed with respect to the localized layer by asubsequent etching treatment; and

selectively removing portions of said masking layer by an etching treatment.

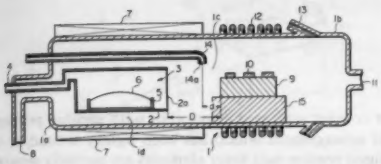
4,137,108
PROCESS FOR PRODUCING A SEMICONDUCTOR DEVICE BY VAPOR GROWTH OF SINGLE CRYSTAL Al_2O_3

Masaru Ihara, and Masayuki Jifuku, both of Kawasaki, Japan, assignors to Fujitsu Limited, Japan

Filed Dec. 9, 1976, Ser. No. 749,099
Claims priority, application Japan, Dec. 13, 1975, 50/147926
Int. Cl.² H01L 21/205, 21/76, 21/86
U.S. Cl. 148—175 25 Claims

1. A process for the production of at least one semiconductor device comprising an Si-single crystal and an epitaxial Al_2O_3 film on the Si-single crystal, said process comprising vapor growth of the Al_2O_3 film on at least one piece of said Si-single crystal, wherein said vapor growth comprises steps of:

(a) contacting an HCl gas with Al in a selected one of solid and liquid states, thereby obtaining a gaseous product;
(b) transferring said resultant gaseous product toward the region of said Si-single crystal(s);
(c) mixing said resultant gaseous product with a CO_2 gas;



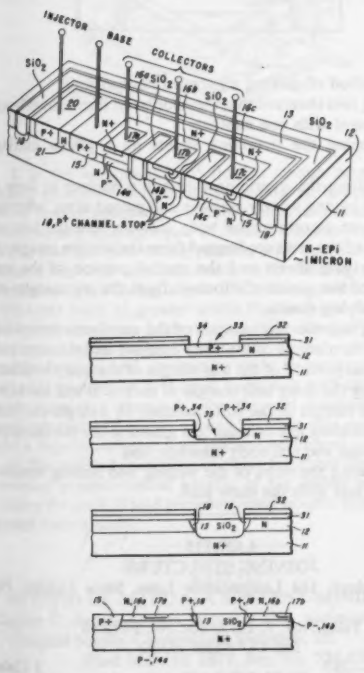
(d) heating said Si-single crystal(s) heating to a temperature of from 950 to 1350° C.; and
(e) contacting said resultant gaseous product, mixed with $CO_2$with said Si-single crystal(s), thereby growing the Al_2O_3 as a single crystal on said Si-single crystal(s).

4,137,109

SELECTIVE DIFFUSION AND ETCHING METHOD FOR ISOLATION OF INTEGRATED LOGIC CIRCUIT

James G. Aiken, and Benjamin J. Sloan, Jr., both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 676,023, Apr. 12, 1976, abandoned. This application Feb. 3, 1977, Ser. No. 765,325
Int. Cl.[2] H01L *21/302, 21/76*
U.S. Cl. 148—175 4 Claims



1. A method for the fabrication of an integrated semiconductor injection logic circuit having an inverted, multiple-collector transistor wherein the base region includes a plurality of lightly-doped active portions and a heavily-doped extrinsic portion, comprising the steps of:

(a) forming a mask layer on a semiconductor slice, said mask layer being resistant to diffusion, etching and oxidation,
(b) patterning said mask layer by removing a portion thereof to define mask apertures which expose an area of said slice to be located between two of said base and/or collector portions.
(c) selectively diffusing a suitable dopant thru said mask apertures into said exposed area of the semiconductor slice, whereby regions are formed which have both vertically and laterally-doped portions,
(d) then selectively etching said exposed area of the slice thru the same mask apertures to remove the full vertical extent of the vertically-doped portions, while leaving at least a part of the laterally-doped portions.
(e) selectively oxidizing the etched areas of the slice to form isolation regions therein which are in some regions adjacent the retained part of said laterally-doped portions, and
(f) completing the device to include active base portions isolated by said oxidized regions, whereby channel inversion is prevented along the isolated boundary of said active base portions.

4,137,110

METHOD OF MAKING LAMINATED INSOLES

Tej K. Singh, Baildon, England, assignor to Associated Paper Industries Limited, London, England

Filed Jul. 19, 1977, Ser. No. 817,000
Claims priority, application United Kingdom, Jul. 27, 1976, 31183/76
Int. Cl.[2] B32B *5/32;* A43B *13/38*
U.S. Cl. 156—62.2 5 Claims

1. In a process of producing an air-permeable wear-resistant insole comprising the steps of
forming a web or matt layer of fibres loaded with active carbon by amn air-laying method onto a wear-resistant fabric which is different from and has greater wear resistance than said web or matt layer
wherein the amount of latex required to adequately bond such fabrics to the web or matt results in lowering permeability of the insole to a useless level;
effecting a first impregnation of said web or matt layer of fibres with a latex binder and
effecting migration of said binder from the interior of said web or matt tó the surfaces thereof,
and curing said binder by the application of heat whereby to form an air-permeable insole,
the improvement which comprises
improving the bonding between said web or matt and said wear-resistant fabric without lowering the permeability of the web or matt to the point where it fails to achieve its intended object, by effecting a second impregnation by coating the outer surface of said wear-resistant fabric section of said insole with a latex binder which contains a sufficient amount of wetting agent to effect a controlled penetration of said binder through said wear-resistant fabric and into the surface of the web or matt attached thereto but an insufficient amount of said wetting ageint to cause complete penetration through to the web or matt layer and curing the said binder by the application of heat.

4,137,111

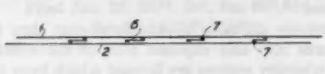
RIBBED TICK AND METHOD OF PREPARING SAID RIBBED TICK

Sigurd S. Hansen, Fruens Boge, Denmark, assignor to Nordisk Fjerfabrik Aktieselskab, Copenhagen, Denmark

Filed Oct. 9, 1974, Ser. No. 513,464
Claims priority, application Denmark, Oct. 9, 1973, 5479/73; Jul. 5, 1974, 3620/74
Int. Cl.[2] A47C *27/08, 27/10;* B32B *3/20, 3/22, 31/10*
U.S. Cl. 156—65 8 Claims

1. A method for making a ribbed tick comprising the steps of introducing between two webs of textile materials a plurality

of ribbons, each comprising a strip of thermoplastic material located at and parallel to one edge on one surface of said ribbon and a strip of thermoplastic material located at and parallel to the opposite edge of the second surface of said ribbon, heating the thermoplastic material to a temperature



sufficiently high to melt the thermoplastic material and then cooling the thermoplastic material so as to form welded seams bonding the edges of said ribbons to the webs of textile material, cutting the bonded webs at spaced locations, joining the webs at their edges and filling channels formed between the ribbons and the webs with flexible insulating filler.

4,137,112

METHOD OF RETREADING A PNEUMATIC TIRE

John A. Hedlund, Findlay, Ohio, assignor to The Hercules Tire & Rubber Company, Findlay, Ohio

Filed Jul. 22, 1977, Ser. No. 818,067
Int. Cl.² B29H *17/36*
U.S. Cl. 156—96 **8 Claims**

1. A method of retreading a tire by mounting a new tread on a pneumatic tire casing, said casing having been buffed to a predetermined profile, comprising the steps of:

providing a precured tread having an integral belt, said belt comprising a plurality of strands disposed in a preselected orientation with respect to the tread,

providing an uncured cushion gum layer having an integral belt, said belt comprising a plurality of strands disposed in a preselected orientation with respect to said layer,

wrapping said cushion gum layer around and securing said layer to said casing so that the strands in said layer are situated in a first orientation with respect to said casing,

wrapping said tread around and securing said tread to said casing over said cushion gum layer, so that the strands in said tread are situated in a second orientation different from said first orientation; and curing the tire.

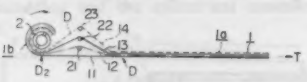
4,137,113

PRODUCTION OF A LIQUID SEPARATION MODULE

Naokatu Kanamaru, Kyoto; Kazuo Imai, Moriyama, and Hisaaki Fujino, Hikone, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 13, 1977, Ser. No. 815,284
Claims priority, application Japan, Jul. 13, 1976, 51-82486; Mar. 29, 1977, 52-34930
Int. Cl.² B65H *81/00*
U.S. Cl. 156—187 **27 Claims**

1. A method of producing a liquid separation module of a spiral type, having a mandrel with a layer arrangement, consisting of a plurality of layer elements, wherein said layer arrangement is tightly wound about said mandrel in such way that, while said layer arrangement is being spirally and tightly wound on said mandrel by rotating said mandrel with the forward end of said layer arrangement fixed to said mandrel, a portion of said layer arrangement which has not yet been tightly wound is forced to bulge in a direction, perpendicular to the surface of said layer arrangement, just before coming



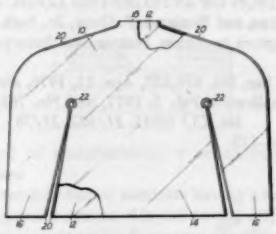
into tight contact with said mandrel or with another portion of said layer arrangement which has been tightly wound, so that at the bulged portion said layer elements are partially separated from each other.

4,137,114

METHOD OF MAKING A UNITARY LIGHTWEIGHT OUTER GARMENT

Pierre L. Ours, 4920 NE. Glisan, Portland, Oreg. 97213

Filed Mar. 4, 1977, Ser. No. 774,232
Int. Cl.² A41D *3/04*; B32B *31/18*
U.S. Cl. 156—251 **1 Claim**



1. The method of making a garment comprising:

(a) Placing two sheets of thin thermoplastic film in overlying engagement with one another;

(b) Positioning the overlying sheets on a planar cutting surface;

(c) Die cutting the overlying sheets in a manner to form a garment having a body member and paired arms, wherein the bottom margin of the body member and the bottom margins of the arms are formed from the bottom margin of the overlying sheets and the medial portion of the top margin of the garment is formed from the top margins of the overlying sheets;

(d) Sealing together the margins of the cut sheets except for the bottom margins of the body member and the arms and the medial portion of the top margin of the body member;

(e) Forming the inner side margin of each arm and the adjacent side margin of the body member by a single cut, said cut terminating in a circular tear gusset at the intersections of the arms and the body member; and

(f) Performing the steps of die cutting and sealing simultaneously and with the same tool.

4,137,115

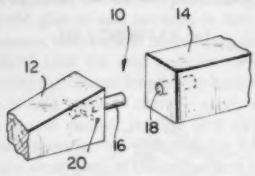
JOINING STRUCTURE

Patrick Lambert, 144 Longmeadow Lane, State College, Pa. 16801

Filed Nov. 7, 1977, Ser. No. 849,285
Int. Cl.² F16B *13/00*
U.S. Cl. 156—257 **1 Claim**

1. A method of securing wooden structures comprising the steps of creating a substantially cylindrical hole in a first wooden member, creating a substantially cylindrical hole in a second member, disposing a substantially cylindrical elongated plastic dowel into said hole in said second member wherein the

diameter of said dowel is substantially equal to the diameter of said hole in said first member, disposing a pin through said second member and said dowel substantially perpendicularly to the longitudinal axis of said dowel, disposing at least a portion of said dowel extending outwardly of said second member into the hole in said first member, and inserting adhesive into said hole in said first member prior to the insertion of said dowel therein.

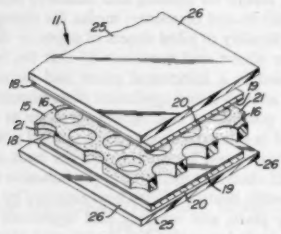


4,137,116

METHOD OF MAKING A PRESSURE SWITCH

Norman K. Miller, Concordville, Pa., assignor to Miller Brothers, Concordville, Pa.

Filed Apr. 22, 1977, Ser. No. 789,807
Int. Cl.[2] H01H *3/02*
U.S. Cl. 156—269 **3 Claims**



1. In the manufacture of flexible switch means, the steps which comprise: continuously feeding an intermediate open work web of resiliently yieldable sealable insulating material, continuously feeding a pair of flexible conductive webs of less width than and into facing relation with opposite faces of said open work web simultaneously with feeding of the latter, simultaneously feeding a pair of flexible non-conductive sealable outer webs of greater width than and into facing relation with opposite outer faces of respective conductive webs, and sealing adjacent longitudinal edges of said outer webs outwardly beyond said conductive webs to projecting longitudinal edge portions of said open work web with said conductive webs remaining unsealed, whereby said conductive webs are each retained in position by and between said open work web and a respective outer web without additional securement.

2. The method according to claim 1, further characterized in severing predetermined lengths of the sealed assembly, and closing the ends of said predetermined lengths to define thereof sealed switch units.

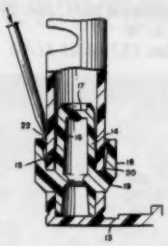
4,137,117

METHOD OF MAKING A SOLVENT-BONDED JOINT

Eugene C. Jones, Laguna Niguel, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 10, 1977, Ser. No. 776,430
Int. Cl.[2] B29C *27/02*
U.S. Cl. 156—294 **16 Claims**

1. A method of joining two plastic members, comprising the steps of fitting said members together in frictional engagement to form a fluid-tight zone of interference between opposing side surfaces of said members and with a tapered crevice between said surfaces leading to said zone, simultaneously spacing said members apart by means of spaced points of contact disposed in a series along the entrance to said crevice and spaced longitudinally from said zone of interference, and thereafter introducing a solvent into said tapered crevice and between said points of contact to form a solvent bond between said members.

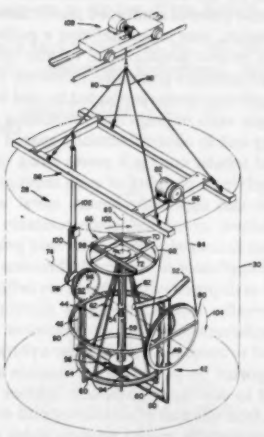


4,137,118

CHEMICAL MILLING APPARATUS

Daniel J. Brimm, La Jolla, Calif., assignor to Chem-tronics, Inc., Santee, Calif.

Division of Ser. No. 785,168, Apr. 6, 1977. This application Sep. 27, 1977, Ser. No. 837,304
Int. Cl.[2] C23F *1/02*
U.S. Cl. 156—345 **9 Claims**

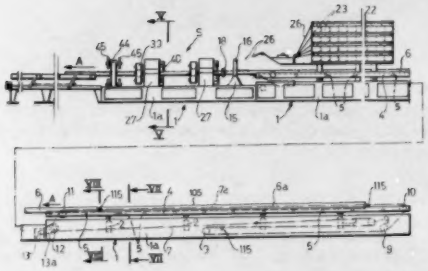


1. Apparatus for supporting a workpiece and effecting a selected pattern of motion of the workpiece in a chemical milling bath, said apparatus comprising: a supporting frame; means for rotating said frame about a first axis; an axle mounted on said frame with its longitudinal axis at right angles to said first axis; a workpiece retainer journalled on said axle for rotation about said axle relative to said frame and for rotation about said first axis concomitantly with said frame; and means for rotating said workpiece retainer about said axle as said frame and retainer are rotated about said first axis comprising a first gear rotatable with the workpiece retainer and a second gear meshed with said first gear, said second gear being non-rotatably fixed relative to said supporting frame, whereby a workpiece supported by said workpiece retainer can be simultaneously rotated about said first axis and the longitudinal axis of the axle on which said retainer is mounted.

4,137,119
APPARATUS FOR MANUFACTURING POLES OF REINFORCED PLASTICS MATERIAL

Aldo Piola, Inverigo (Como), Italy, assignor to Dayton G.R.P. S.r.l., Milan, Italy

Filed Jan. 28, 1977, Ser. No. 763,550
Claims priority, application Italy, Jan. 29, 1976, 19717 A/76; May 14, 1976, 23285 A/76
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—431 3 Claims

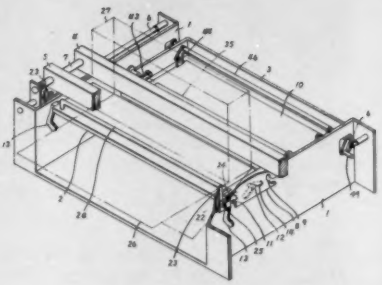


1. Apparatus for the continuous manufacture of cylindrical or conical tubular poles of reinforced plastic material, comprising, in combination, base means defining a guide path adapted to sequentially receive prefabricated tubular cores, means for continuously advancing a prefabricated tubular core along said guide path, applicator means supported by said base means and adapted to apply resin impregnated reinforcing threads longitudinally along and in circumferentially spaced relation about a prefabricated tubular core as it passes along said guide path, means for supplying a plurality of resin impregnated reinforcing threads to said applicator means, spiral winding means including a hollow cylindrical drum rotatably supported by said base means in coaxial relation with said guide path downstream of said applicator means in the direction of advance of said core, means disposed within said drum defining an annular chamber internally thereof having a plurality of recesses spaced circumferentially about said chamber and-- was inserted; adapted to contain a bath of resin, a plurality of bobbins rotatably supported on said drum for rotation about axes disposed parallel to said guide path, said bobbins being equidistantly spaced from the axis of rotation of said drum in equidistantly circumferentially spaced relation about said drum and each supporting a length of reinforcing thread, a plurality of thread guides corresponding in number to said bobbins and being mounted on said drum externally of said annular chamber in a position to receive a thread from an associated one of said bobbins, said thread guides each extending substantially radially toward the axis of rotation of said drum so as to be disposed in closer proximity to said drum axis than said annular chamber, means supported on said drum for guiding a thread from each bobbin through one of said recesses to a corresponding thread guide, and means operatively associated with said drum for effecting rotation thereof about the axis of said guide path so as to effect spiral winding of resin impregnated reinforcing threads from said thread guides circumferentially about said hollow core and said longitudinal reinforcing threads thereon as said core is passed through said rotating drum.

4,137,120
BOOKBINDING MACHINE

Masaaki Shimizu, Q Flat Bldg., 31, Banshu-cho, Shinjuku-ku, Tokyo, Japan

Filed Aug. 19, 1977, Ser. No. 826,065
Claims priority, application Japan, Aug. 24, 1976, 51/113734[U]; Aug. 24, 1976, 51/113735[U]; Aug. 24, 1976, 51/113736[U]
Int. Cl.[2] B05C *1/02*
U.S. Cl. 156—556 10 Claims

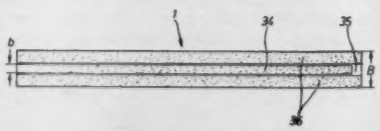


1. A bookbinding machine comprising: a container for containing a hot melt type of adhesive therein; an adhesive applicator plate having a heat retaining body for being disposed in said container; means for heating said adhesive and said applicator plate while in said container; means for clamping a book comprising a plurality of piled sheets of paper or the like to be bound together above said container so that the back of said book is disposed in a horizontal plane and faces the upper surface of said adhesive; and applicator plate positioning means for selectively positioning said applicator plate at a first position submerged in said adhesive and at a second position raised out of said adhesive and in contact with the back of said book clamped by said clamping means to apply adhesive to said back while concurrently heating it with heat retained by the body of said applicator plate, and wherein said applicator plate positioning means includes means for raising said plate obliquely from said position submerged within said adhesive to the upper surface of said adhesive and then bringing said plate to a horizontal position as said plate is moved to said second position.

4,137,121
DEVICE FOR ATTACHING SPECIFICALLY TAPELIKE CUTS TO CONTAINERS

Alois Müller, Barbing, Fed. Rep. of Germany, assignor to Hermann Kronseder, Worth, Fed. Rep. of Germany

Filed Sep. 12, 1977, Ser. No. 832,256
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1976, 2642046
Int. Cl.[2] B65C *9/08*
U.S. Cl. 156—571 1 Claim



1. Apparatus for applying strips such as labels to articles such as containers wherein a supply stack of strips is provided, comprising:

rotatably driven turret means,

a plurality of members having curved surfaces mounted on said turret means for being turned and for being moved in an orbit when said turret means rotates, the axially extend-

ing width of said curved surfaces being less than the width of said strips, and the circumferentially extending length of said curved surfaces being short of the length of said strips, said curved surface making contact centrally of said strips,

roller means adjacent the orbital path of said members for applying cold glue to said surfaces as they pass said glue applying means, said stack of strips being disposed relative to said orbital path for said surfaces to effect a rolling action on only the central lengthwise extending portion of said strips in said stack to thereby apply a first stripe of cold glue to said central portion of a strip short of the length of said strip and for withdrawing it from said stack and leaving a short zone at the end of said stripe where no cold glue is applied,

another rotatably driven generally cylindrical means adjacent the orbital path of said members and means on said cylindrical means for gripping said orbiting strips at the end of the first stripe where glue has not been applied to thereby cause removal of said strips from said surfaces and their transfer to said cylindrical means,

another roller means having a central annular groove at least as wide as said first stripe for applying additional stripes of hot melt glue over the full length of the strips and to parts of said strips on opposite sides of where said first stripe of glue had been applied as said strips rotate with said cylindrical means, and

means for transferring said strips from said cylindrical means to articles after said additional stripes of glue are applied.

4,137,122

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

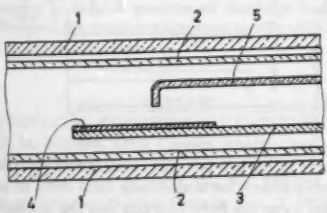
Gerard A. Acket, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 11, 1977, Ser. No. 795,733

Claims priority, application Netherlands, May 17, 1976, 7605234

Int. Cl.² H01L *21/66*; G01N *21/02*

U.S. Cl. 156—601 **2 Claims**



1. A method of manufacturing a semiconductor device which comprises the steps of:

providing a semiconductor substrate;

epitaxially depositing on said substrate a compound comprising at least two semiconductor materials and having an energy gap which is smaller than that of the substrate;

measuring the thermal emission spectrum of the epitaxially deposited compound during deposition; and

controlling the composition of said compound during deposition as a function of its measured thermal emission spectrum.

4,137,123

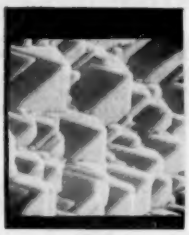
TEXTURE ETCHING OF SILICON: METHOD

William L. Bailey, Scottsdale; Michael G. Coleman, Tempe; Cynthia B. Harris, Phoenix, and Israel A. Lesk, Scottsdale, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1975, Ser. No. 645,573

Int. Cl.² H01L *31/18*

U.S. Cl. 156—647 **3 Claims**



1. A method for decreasing the reflectance of a silicon surface in the wavelength range 0.3 to 1.1 microns comprising:

contacting said surface with an etchant comprising an anisotropic etchant containing 0.5 to 10 percent by weight of silicon prior to said contacting; and

etching said surface in said etchant comprising an anisotropic etchant to achieve a pyramidal-shaped texture.

4,137,124

HEAD BOX FOR A PAPERMAKING MACHINE

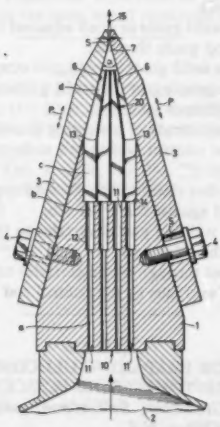
Alfred Bubik, and Hans-Joachim Schultz, both of Ravensburg, Germany, assignors to Escher Wyss GmbH, Ravensburg, Germany

Filed May 3, 1977, Ser. No. 793,258

Claims priority, application Switzerland, May 11, 1976, 5871/76

Int. Cl.² D21F *1/02, 1/06*

U.S. Cl. 162—343 **10 Claims**



1. A head box for a papermaking machine comprising

a pair of oppositely disposed sidewalls converging towards each other to form a nozzle duct and a pulp exit throat at one end of said nozzle duct;

a distributor between said sidewalls of said nozzle duct, said distributor having a plurality of pulp distributing ducts extending therethrough towards said throat, each said duct having at least one step-like widening therein; and

an insert mounted on said distributor between said sidewalls,

said insert forming a plurality of terminal sections for said distributing ducts, each said terminal section being disposed in communication with a respective duct downstream of said widening therein relative to a flow of pulp therethrough, said terminal sections being disposed to converge towards said throat.

4,137,125

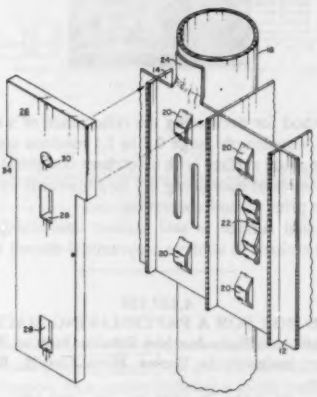
METHOD OF WELDING NUCLEAR REACTOR FUEL ASSEMBLIES

John M. Walters, Orangeburg, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 12, 1976, Ser. No. 741,436

Int. Cl.[2] G21C *3/30*; B23K *9/28, 5/00*

U.S. Cl. 176—78 **3 Claims**



1. A method of welding control rod guide thimbles to tabs formed on fuel assembly grid straps which define the cells in which the guide thimbles are located comprising the steps of:

placing control rod guide thimbles in cells provided in a fuel assembly grid;

positioning a weld guide in a cell adjacent the cell containing a control rod guide thimble;

supporting the weld guide on said grid straps, and accurately locating an opening in the weld guide with the approximate centerline of said tabs;

inserting one electrode of a welding gun through said opening and into contact with a tab to be welded to a guide thimble;

locating the other electrode on the side opposite of the guide thimble and against the other tab;

clamping the welding gun electrodes to the tab and control rod guide thimbles, and

passing current through said electrodes to effect a first spot welding of said tabs to the control rod guide thimble.

4,137,126

PROCESS FOR PREPARING GLUCOSE ISOMERASE USING *STREPTOMYCES GLAUCESCENS* MUTANTS

Peter Weber, Greifensee, Switzerland, assignor to Givaudan Corporation, Clifton, N.J.

Continuation of Ser. No. 680,608, Apr. 26, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,332

Claims priority, application Switzerland, May 3, 1975, 5702/75

Int. Cl.[2] C12D *13/10, 13/02*

U.S. Cl. 195—66 R **10 Claims**

1. A process for the manufacture of a glucose-isomerase, which comprises cultivating under aerobic conditions a mutant of *Streptomyces glaucescens* NRRLB-2900 having no or practically no intra-cellular tyrosinase activity in a nutrient medium containing a source of assimilable carbon and a source of assimilable nitrogen.

4,137,127

PROCESS FOR THE PREPARATION OF THROMBIN-LIKE ENZYMES FROM SNAKE VENOMS

Kurt F. Stocker, Oberwil, Switzerland, assignor to Pentapharm A.G., Basel, Switzerland

Filed Jul. 27, 1977, Ser. No. 819,473

Claims priority, application Switzerland, Aug. 17, 1976, 10493/76

Int. Cl.[2] C07G *7/026*

U.S. Cl. 195—66 B **15 Claims**

1. A process for preparing thrombin-like proteolytic enzymes from snake venoms or fractions thereof which comprises contacting the said snake venom or fraction thereof in an aqueous medium with insolubilized heparin bound to a water-insoluble carrier in order to bind the thrombin-like enzyme to the insolubilized heparin, removing undesirable accompanying substances of the snake venom and splitting the thrombin-like enzyme from the insolubilized heparin in an aqueous medium.

4,137,128

BATTERY OF HORIZONTAL COKE OVENS AND METHOD FOR OPERATING THE SAME

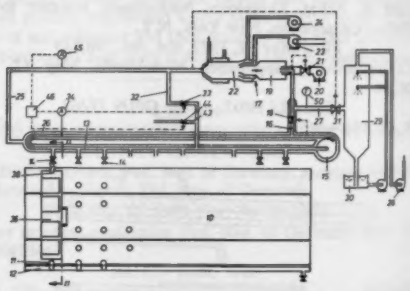
Lewis A. Watson, Oldham, England, assignor to Dr. C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Mar. 21, 1977, Ser. No. 779,631

Claims priority, application United Kingdom, Mar. 19, 1976, 11073/76

Int. Cl.[2] C10B *27/00, 27/04, 27/06*

U.S. Cl. 202—256 **9 Claims**

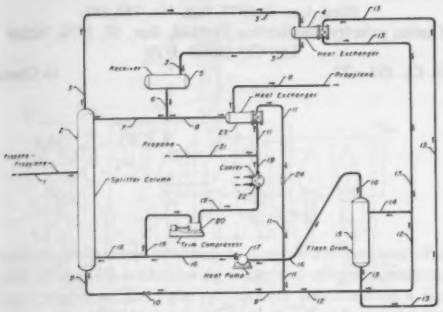


1. In a battery of horizontal coke ovens, a first gas-collecting main, first valve means for connecting each oven to said first main after that oven has been charged and the normal coking process proceeds, a second gas-collecting main in the form of a loop, second valve means for connecting each oven to said second gas-collecting main during the occurrence of dust in the off-gas from the oven due to charging of that oven, a fan for circulating off-gases in the loop, a first exit duct connected to the loop, a third valve in the first exit duct for regulating the passage of off-gases therethrough, means for burning at least a portion of the off-gases passing through said third valve, and means for indirectly heating said second main with the burned off gas to maintain the temperature in the second main at a level which will prevent condensation of tars in the off gas therein.

4,137,129
FRACTIONATION PROCESS

Bradford L. Bjorklund, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 7, 1977, Ser. No. 840,346
Int. Cl.[2] C07C 7/04; B01D 1/28, 3/06
U.S. Cl. 203—26 18 Claims



1. A process for separating two chemical compounds by fractionation which comprises the steps of:

(a) passing a feed stream comprising a first and a second chemical compound into a fractionation zone operated at fractionation conditions;

(b) removing an overhead vapor stream which is rich in the first chemical compound from the fractionation zone, at least partially condensing the overhead vapor stream by indirect heat exchange to produce overhead liquid, supplying a portion of the overhead liquid to the fractionation zone as reflux and removing a portion of the overhead liquid as a first product stream;

(c) removing a bottom liquid stream which is rich in the second chemical compound from the fractionation zone and flashing the bottoms liquid stream to produce a mixed-phase stream having a lower pressure and temperature than the bottoms liquid stream;

(d) dividing the mixed-phase stream into a liquid fraction and a vapor fraction;

(e) heat exchanging at least a portion of the liquid fraction against the overhead vapor stream to effect the previously described condensation of the overhead vapor stream;

(f) compressing a working vapor stream, which comprises at least a first portion of the vapor fraction of the mixed-phase stream, to form a high pressure vapor stream having a higher temperature than the bottoms liquid stream; and,

(g) passing at least a portion of the high pressure vapor stream into the fractionation zone to effect the reboiling of the fractionation zone.

4,137,130
AUTOMATIC STRIPPING OF CATHODE ZINC

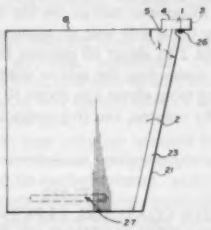
Robert D. H. Willans, Trail, Canada, assignor to Cominco Ltd., Vancouver, Canada

Filed Nov. 29, 1977, Ser. No. 855,769
Claims priority, application Canada, Dec. 3, 1976, 267119
Int. Cl.[2] C25C 1/00, 7/00, 7/08
U.S. Cl. 204—12 18 Claims

1. In an apparatus for the separation of a layer of electrodeposited metal from the surface of a basis metal electrode plate wherein the separation is effected by detaching the electrodeposited metal from the basis metal electrode by a stripping means inserted between the electrodeposited metal and the electrode, and moved substantially in the plane of the intermetallic boundary and wherein at least a portion of one boundary edge of the electrodeposited metal and an exposed portion of the basis metal electrode plate face, exposed by the removal of an edge insulator strip, each comprise the faces of a V-shaped groove, the included angle between the faces defining the groove being less than 90°, and wherein the basis metal electrode plate carrying the layer of electrodeposited metal is supported in a substantially vertical position during the separation process, the improvement comprising a single unitary stripping means incorporating therein in integral relationship a first stripping means and a second stripping means, together with support means for the single unitary stripping means, wherein:

(a) the first stripping means comrises a wedge adapted to be inserted into the V-shaped groove to initiate separation of the electrodeposited metal from the basis metal electrode plate;

(b) the second stripping means comprises a blade adapted to propagate the separation of the electrodeposited metal from the basis metal electrode plate; and

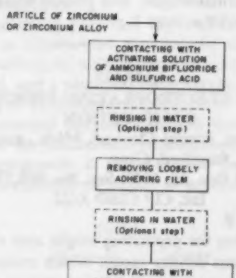


(c) the support means comprises a mounting for the single unitary stripping means and includes means for the continuous movement of the single unitary stripping means substantially in the plane of the intermetallic boundary through a first position whereat the first stripping means engages the V-shaped groove and initiates separation of the electrodeposited metal from the basis metal electrode plate, through an intermediate position whereat the second stripping means enters the gap resulting from the initial separation of the electrodeposited metal from the basis metal electrode plate, and to a third position whereat the cooperating action of the first and second stripping means causes substantial separation of the electrodeposited metal from the basis metal electrode plate.

4,137,131
PROCESS FOR ELECTROLYTIC DEPOSITION OF METALS ON ZIRCONIUM MATERIALS

Robert E. Donaghy, Wilmington, N.C., assignor to General Electric Company, San Jose, Calif.

Filed Oct. 4, 1976, Ser. No. 729,861
Int. Cl.[2] C25D 5/34
U.S. Cl. 204—32 R 19 Claims


ARTICLE OF ZIRCONIUM OR ZIRCONIUM ALLOY
CONTACTING WITH ACTIVATING SOLUTION OF AMMONIUM BIFLUORIDE AND SULFURIC ACID
RINSING IN WATER (Optional step)
REMOVING LOOSELY ADHERING FILM
RINSING IN WATER (Optional step)
CONTACTING WITH ELECTROLYTIC PLATING SOLUTION IN PRESENCE OF AN ELECTRODE RECEIVING CURRENT
RINSING IN WATER (Optional step)

1. In a process for the electrolytic deposition of a metal film

on an article comprised of zirconium or a zirconium alloy comprising the steps of

(a) activating the article in an aqueous activating solution comprising from about 10 to about 20 grams per liter of ammonium bifluoride and from about 0.75 to about 2 grams per liter of sulfuric acid, the solution being aged by immersion of pickled zirconium in said solution for about 10 minutes, and

(b) contacting the article with an electrolytic plating solution containing the metal to be deposited on the article in the presence of an electrode receiving current; the improvement comprising removing any loosely adhering film formed on the article in the activating step prior to practicing the contacting step, said improvement of removing any loosely adhering film being selected from the group consisting of (i) immersing the article in water and applying ultrasonic energy on the immersed article, (ii) contacting the article with an aqueous solution comprising from about 2 to about 10 percent fluoboric acid by volume, (iii) contacting the article with an aqueous solution comprising from about 2 to about 10 percent hydrofluosilicic acid by volume, and (iv) contacting the article with a swab.

4,137,132

CHROMITE COATINGS, ELECTROLYTES, AND ELECTROLYTIC METHOD OF FORMING THE COATINGS

John J. B. Ward, and Clive Barnes, both of Wantage, England, assignors to BNF Metals Technology Centre, Wantage, England

Filed May 31, 1977, Ser. No. 802,193

Claims priority, application United Kingdom, Jun. 1, 1976, 22686/76

Int. Cl.[2] C25D *11/38*

U.S. Cl. 204—38 R **26 Claims**

1. An aqueous trivalent chromium electrolyte for the disposition of protective chromite deposits consisting apart from water essentially of:

(i) Cr^{III} ions in a concentration of from 0.1 to 2 molar;

(ii) a weak complexing agent for Cr^{III} ions selected from the group consisting of hypophosphite, glycine, gluconolactone, glycolic acid, acetic acid, citric acid, and formic acid said complexing agent being present in a molar concentration of at least 0.5 times that of the Cr^{III} ion present;

(iii) a conductivity salt in a concentration of at least 0.5 molar; and

(iv) as the sole poison for the cathodic reduction of Cr^{III} to CR^{0}, a member selected from the group consisting of H_2O_2, peroxy acid salts, nitrate ions, a polyamine, a phosphate and formaldehyde, said poison being present in a concentration of at least 1 gl^{-1}.

4,137,133

ACID ZINC ELECTROPLATING PROCESS AND COMPOSITION

Donald A. Arcilesi, Mount Clemens, Mich., assignor to M&T Chemicals Inc., Stamford, Conn.

Filed Dec. 15, 1977, Ser. No. 860,774

Int. Cl.[2] C25D *3/22*

U.S. Cl. 204—55 R **8 Claims**

5. A composition for producing bright zinc electrodeposits over a wide current density range, which comprises an aqueous acidic bath composition containing at least one zinc compound providing zinc cations for electroplating zinc and containing as cooperating additives 1 to 50 g/l of at least one bath soluble substituted or unsubstituted polyether, 0.01 to 10 g/l of at least one aliphatic unsaturated acid containing an aromatic or heteroaromatic group and 0.001 to 10 g/l of at least one aromatic or N-heteroaromatic aldehyde.

4,137,134

METHOD FOR THE RECOVERY OF SULPHUR COMPOUNDS, VOLATILE ALCOHOLS, TURPENTINE AND THE LIKE PRODUCED IN CONNECTION WITH PULPING

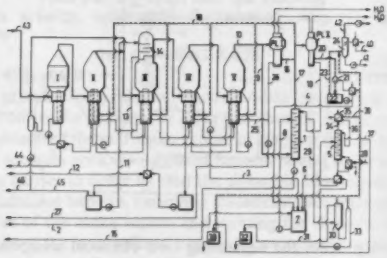
Jorma Suominen; Carl-Johan Candolin, and Arvi Rönnholm, all of Pori, Finland, assignors to Oy W. Rosenlew Ab., Pori, Finland

Filed Apr. 8, 1977, Ser. No. 785,894

Claims priority, application Finland, Apr. 20, 1976, 761069

Int. Cl.[2] B01D *3/10*

U.S. Cl. 203—73 **16 Claims**



1. A method for the recovery of materials selected from the group consisting of sulphur compounds, volatile alcohols such as methanol, and by-products such as turpentine, which are produced in connection with pulping, from blow-expansion condensates from evaporating series of digestery, from turpentine mother liquors, or from other liquids in a separate treatment unit, characterized in that said liquids are treated in a vacuum stripping unit by means of a proportion of secondary steam necessary for the treatment of the liquid quantity, which secondary steam is obtained from the last stage of a multi-stage evaporating plant, an excess of secondary steam is condensed by means of indirect condensation in a first surface condenser, whose exhaust vapors, together with the vapors leaving the stripping unit and with the exhaust vapors that are to be removed from the evaporating steps, are condensed by means of indirect condensation in a second surface condenser, the condensate from the latter is used as return flow into the stripping unit, and the gases leaving the condenser are, by means of a vacuum device, passed into the condensate tank of the evaporating plant, the gas fraction obtained from same is removed to a separate treatment, as well as the condensate fraction produced therein is either recirculated to the treatment or recovered separately, at the same time as purified liquid from the stripping unit is returned to the process and the return flow from the second surface condenser is recovered.

4,137,135

PROCESS AND APPARATUS FOR SEPARATING LIGHT OIL FROM A MIXTURE COMPRISING WASTE OIL

Donald Glassman, Pittsburgh, and Marc T. Rabbits, Jeannette, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

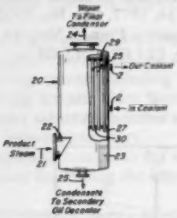
Filed Apr. 21, 1976, Ser. No. 678,836

Int. Cl.[2] B01D *3/38*; C07C *7/04*; C10G *5/04*

U.S. Cl. 203—87 **20 Claims**

1. A process of separating water and wash oil from a gaseous feed stream of water vapor, wash oil and light oil comprising (a) directing the gaseous feed stream in an upward direction and in contact with a cooling solid surface in the form of a vertical knock-back condenser containing vertical tubes for passage of the gaseous feedstream upward through the inside of these tubes such that a temperature gradient of the gaseous stream is produced such that the temperature of the gaseous stream is highest at the bottom of the cooling solid surface such that gaseous components of the gaseous stream having the highest boiling temperature condense onto the lower portions

of the cooling solid surface and wherein the lower boiling components of the gaseous stream condense onto said solid surface at higher portions on said solid surface to thereby form a liquid film on said solid surface which film then runs downward onto the lower portions of said solid surface to thereby



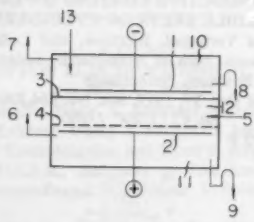
inhibit deposits from adhering to these lower portions of said solid surface; (b) withdrawing a gaseous stream containing a major portion of the light oil; and (c) withdrawing a liquid condensate which contains substantially all of the wash oil and a major portion of the water.

4,137,136

METHOD FOR ELECTROLYZING ALKALI METAL HALIDE AQUEOUS SOLUTION

Tadao Ueda; Teruo Nagaya, and Koji Kawada, all of Tokyo, Japan, assignors to Asahi Denka Kogyo Kabushiki Kaisha, Japan

Filed Oct. 12, 1977, Ser. No. 841,436
Claims priority, application Japan, Oct. 22, 1976, 51-126275
Int. Cl.[2] C25B *1/26, 1/34*
U.S. Cl. 204—98 **2 Claims**



1. A method for electrolyzing an alkali metal halide aqueous solution in a three-chamber system horizontal type electrolytic cell which comprises (a) a cathode chamber having a cathode positioned above a cation exchange membrane substantially horizontally positioned, (b) a middle chamber partitioned with said cation-exchange membrane and a diaphragm positioned at the lower part opposite the cation-exchange membrane and (c) an anode chamber having an anode positioned below said diaphragm, characterized in that said method comprises charging an alkali metal halide aqueous solution into the middle chamber, taking hydrogen gas and concentrated alkali metal hydroxide aqueous solution having a desired concentration out of the cathode chamber while optionally supplying water or dilute alkali metal hydroxide aqueous solution to the cathode chamber, and taking halogen gas out of the anode chamber and simultaneously taking diluted alkali metal halide aqueous solution out of the anode chamber in such a manner as to make the anode chamber work substantially as a gas chamber.

4,137,137

RADIATION PROCESS FOR THE PRODUCTION OF GRAFT COPOLYMER TO BE USED FOR ION-EXCHANGE MEMBRANE

Sueo Machi, Takasaki; Takanobu Sugo, Gunma; Akio Sugishita; Sakunobu Kanai, both of Takasaki, and Hiroshi Fujiwara, Ohmiya, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo and Maruzen Oil Company Limited, Osaka, both of, Japan

Filed Jul. 13, 1977, Ser. No. 815,423
Claims priority, application Japan, Jul. 14, 1976, 51-83765
Int. Cl.[2] C08F *8/00*
U.S. Cl. 204—159.16 **4 Claims**

1. A process for the production of a graft copolymer to be used for an ion-exchange membrane which comprises:

co-grafting a mixture of monomers selected from the group consisting of acyloxystyrene, hydroxystyrene, and mixtures thereof,

a polyene compound selected from the group consisting of divinylbenzene, isoprene, butadiene, cyclopentadiene, ethylidenenorbornene, diol ester of acrylic acid, diol ester of methacrylic acid, and divinyl ester of adipic acid, and acrylic or methacrylic acid,

onto a hydrocarbon type polymer selected from the group consisting of polyethylene, polypropylene, polybutene, polystyrene, poly(α-methylstyrene), polyvinylcyclohexane and copolymers which consist essentially of the major components of said above mentioned hydrocarbon type polymers, or

a fluorine-containing type polymer selected from the group consisting of polyethylene tetrafluoride, polyvinylidene fluoride, ethylene-ethylene tetrafluoride copolymer, ethylene tetrafluoride-propylene hexafluoride copolymer, and vinylidene fluoride-propylene hexafluoride copolymer,

by means of ionizing radiation.

4,137,138

RADIATION CURABLE COMPOSITIONS

Colin B. Batt, Acton; Helena Z. Kucharska, Weston, and Arie Jansen, Rexdale, all of Canada, assignors to Reichhold Chemicals Limited, Islington, Canada

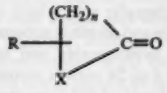
Filed Nov. 4, 1975, Ser. No. 628,782
Claims priority, application Canada, Nov. 7, 1974, 213193
Int. Cl.[2] C08F *8/30*; C08G *63/76*
U.S. Cl. 204—159.18 **22 Claims**

1. A radiation-polymerizable composition comprising a mixture of components A and B, in which component A is chosen from

(a) an unsaturated polyester derived from a polyhydric alcohol and an unsaturated dicarboxylic acid or an unsaturated dicarboxylic acid anhydride containing a single ethylenic bond; or

(b) an unsaturated polyester derived from a polyhydric alcohol, an unsaturated dicarboxylic acid or an unsaturated dicarboxylic acid anhydride containing one ethylenic bond, and a saturated dicarboxylic acid or saturated dicarboxylic acid anhydride; or

(c) an unsaturated polyester derived from a polyglycidyl ether and an unsaturated monocarboxylic acid; and in which component B represents at least one saturated monomeric lactone or lactam of general formula I



in which formula X represents oxygen or an imino (—NH—) group; n is an integer selected from the group comprising the numbers 3, 4, 5, and 6; and R represents hydrogen, or an alkyl group containing 1 to 12 carbon atoms and may be branched, linear or cyclic in configuration, said composition containing

from 10% to 90% by weight of component A and from 90% to 10% by weight of component B, based on the total weight of polyester, and lactone, and/or lactam present.

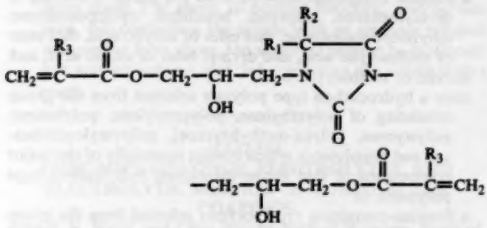
4,137,139

RADIATION CURABLE HYDANTOIN DIACRYLATE COMPOUNDS

Raymond Seltzer, New City, and Joseph F. DiPrima, Hartsdale, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 10, 1976, Ser. No. 694,740
Int. Cl.² C08F 2/46, 4/00
U.S. Cl. 204—159.23 **10 Claims**

1. An hydantoin diacrylate compound of the formula



wherein R_1 is hydrogen, alkyl containing 1 to 8 carbon atoms; R_2 is alkyl containing 5 to 8 carbon atoms; and R_3 is hydrogen or methyl.

4,137,140

CATHODIC ELECTROCOATING

William J. Belanger, Louisville, Ky., assignor to Celanese Polymer Specialties Company, Louisville, Ky.

Division of Ser. No. 715,266, Aug. 18, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,296
Int. Cl.² C25D 13/00
U.S. Cl. 204—181 C **8 Claims**

1. A method of coating an electrically conductive substrate which comprises

(I) passing an electric current between an anode an a cathode in contact with water dispersed composition in which the major resinous component is an ionizable salt of an acid and the ungelled reaction product of

(A) a polyepoxide resin derived from a dihydric phenol and an epihalohydrin, said polyepoxide resin having a 1,2-epoxide equivalent weight of about 400 to about 4000 and

(B) a polyamine having at least 2 amine nitrogen atoms per molecule, at least 3 amine hydrogen atoms per molecule and no other groups reactive with epoxide groups; followed by reaction with

(C) a monoepoxide which contains one 1,2-epoxide groups and no other groups reactive with amine groups, or a monocarboxylic acid which contains one carboxylic acid group and no other groups reactive with amine groups, said monoepoxide and monocarboxylic acid having about 8 to 24 carbon atoms per molecule,

wherein about 1 mol of (B) is reacted with each epoxide equivalent of (A), about 2 to about 6 mols of (C) are reacted per each mol of (A) and wherein said reaction product has a weight per active nitrogen of about 200 to about 600, and

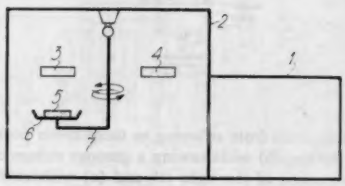
(II) depositing a coating on the cathode.

4,137,141

PROCESS FOR PRODUCING A SILICON NITRIDE DIFFUSION BARRIER ON A SEMICONDUCTOR SUBSTRATE, PARTICULARLY III–V SEMICONDUCTOR SUBSTRATES

Loïc G. Henry, 16, Residence du Roux, and Pierre N. Favennec, Crec'h Lia, Beg Leguer, both of 22300 Lannion, France

Filed Nov. 14, 1977, Ser. No. 850,951
Claims priority, application France, Nov. 18, 1976, 76 35294
Int. Cl.² C23C 15/00
U.S. Cl. 204—192 EC **7 Claims**



1. A process for forming a silicon nitride diffusion barrier by cathode sputtering onto a dioxidized semiconductor substrate which has been preheated to approximately 400° C., which comprises the following steps,

cathode sputtering in a nitrogen atmosphere with a silicon target to grow a first silicon nitride layer on the substrate,

ionically etching the exposed surface of the silicon nitride layer in an atmosphere of nitrogen and argon until the first silicon nitride layer has been reduced by about one half, and

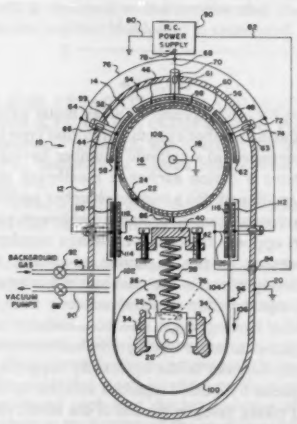
cathode sputtering in a nitrogen atmosphere with a silicon target, a second silicon nitride layer upon the reduced silicon nitride layer to form the desired diffusion barrier.

4,137,142

METHOD AND APPARATUS FOR SPUTTERING PHOTOCONDUCTIVE COATING ON ENDLESS FLEXIBLE BELTS OR CYLINDERS

Jacobus-Gerardus Vertegaal, Boxmeer, and Lodewijk Anselrode, St. Anthonis, both of Netherlands, assignors to Stork Brabant B.V., Boxmeer, Netherlands

Filed Dec. 27, 1977, Ser. No. 864,330
Int. Cl.² C23C 15/00
U.S. Cl. 204—192 P **14 Claims**



1. Sputtering apparatus for sputtering a coating of a photo-

conductive material onto a flexible sleeve substrate member which comprises:

A. a sputtering vessel having a sputtering chamber and means for establishing an r.f. plasma condition in the chamber including target means of a photoconductive material and anode means arranged opposite the target means and defining at least one gap between them within which the plasma condition appears during the sputtering operation,

B. means for configuring the sleeve substrate member in an oval configuration having arcuate ends and straight sides, said configuring means including at least two support members having arcuate sides facing away from one another, the sleeve substrate member adapted to be stretched between the support members,

C. means for applying tension to the straight sides and comprising structure for biasing the support members to move apart, and

D. means for driving the sleeve substrate member over the support members to pass through said gap.

14. A method of sputtering a photoconductive material onto a flexible sleeve substrate member in a sputtering chamber which has means for establishing a sputtering condition within the chamber which comprises:

A. providing in the chamber a pair of supports having arcuate ends,

B. moving the supports towards one another a distance sufficient to enable the substrate member to be looped over the supports,

C. moving the supports apart after so engaging the substrate member a sufficient amount to form an oval having arcuate ends closely engaging over the arcuate ends of the supports and straight sides between the arcuate ends of the oval,

D. establishing a sputtering condition including a plasma belt within the chamber,

E. translating the substrate member in a repetitive cycle through the plasma belt while maintaining tension on the straight sides for a period of time to deposit a coating of photoconductive material,

F. discontinuing the sputtering condition,

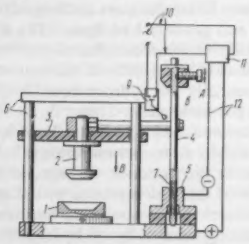
G. moving the supports toward one anotheer to relieve the tension and loosen the substrate member, and

H. removing the substrate member from the chamber.

4,137,143
APPARATUS FOR ELECTROCHEMICAL MACHINING OF METAL PARTS

Vladimir I. Suslin; Boris A. Makeev; Alexandr I. Dubovik; Zinovy A. Lekarev; Vitaly A. Pilipenko; Alexandr I. Etnaer; Anatoly A. Kolesnichenko, and Pavel S. Razdymakha, all of Kharkov, U.S.S.R., assignors to Nauchno-Issledovatelsky Institut Avtomatizatsii Upravlenia I Proizvodstva Niiap, U.S.S.R.

Filed Dec. 14, 1977, Ser. No. 860,373
Int. Cl.[2] B23P *1/02, 1/12*
U.S. Cl. 204—224 M **3 Claims**

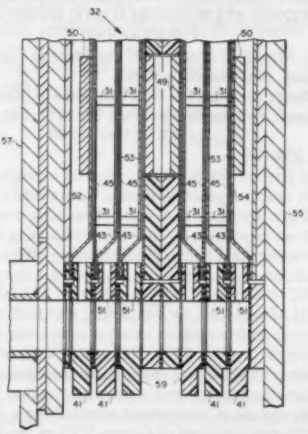


1. Apparatus for electrochemically machining metal workpieces comprising, an electrically conductive stationary support for supporting a metal workpiece to be electrochemically machined, an electrically conductive mobile support for an electrode-tool and movable toward and away from the workpiece, a pair of electrical contacts for providing electrical current to the stationary support and to the mobile support respectively, one of said contacts constituting a stationary contact and the other a mobile contact continuously slidably guided on the stationary contact during relative movement therebetween as said mobile support moves toward and away from said workpiece, means connecting the mobile contact to the mobile support comprising means establishing electrical connection therebetween and means for effecting proportional travel of the mobile contact jointly with the mobile support, said mobile contact having a non-conductive portion slidable on the stationary contact electrically isolating the two contacts during a certain distance of relative travel therebetween and maintaining the mobile contact guided on the stationary contact as said mobile support is retracted away from the workpiece to retract the electrode tool, a circuit for energizing the pair of contacts, and means on said mobile contact for closing said circuit as said electrode-tool moves toward said workpiece for variably setting the length of travel of the mobile support and electrode-tool thereon toward said workpiece, thereby variably setting when electrical current is applied to the two contacts and the workpiece and the electrode tool.

4,137,144
HOLLOW BIPOLAR ELECTROLYTIC CELL ANODE-CATHODE CONNECTING DEVICE

Edward J. Kenney, Cheektowaga, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,390
Int. Cl.[2] C25B *9/04, 11/00, 11/10*
U.S. Cl. 204—268 **15 Claims**

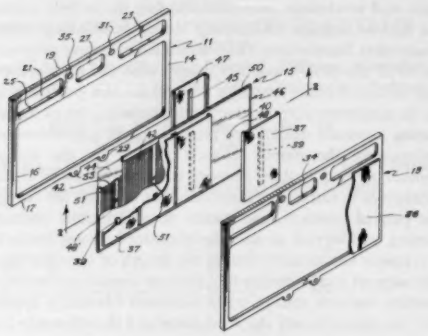


1. In a hollow bipolar electrode, comprising an anode member and a cathode member, each of which is formed of nonforaminous metal, at least one of said members having a concave portion which, when said members are joined together in electrically conductuve contact along the periphery thereof, forms a hollow section in the interior of said bipolar electrode, the improvement comprising at least one electrically conductive connecting device between said anode member and said cathode member, within the hollow section, said connecting device providing dimensional control of the inter-electrode gap between adjacent bipolar units.

4,137,145
SEPARATING WEB FOR ELECTROLYTIC APPARATUSES

Bruce S. Wallace, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Filed Jan. 3, 1978, Ser. No. 866,447
Int. Cl.[2] C25B *1/16, 1/12, 9/00*
U.S. Cl. 204—290 R 17 Claims



1. A separating web for use in an electrolytic apparatus having a plurality of cells containing anolyte and catholyte which comprises an anolyte side wall of a material resistant to corrosion by and impermeable to such anolyte and a catholyte side wall of material resistant to corrosion by and impermeable to such catholyte, said walls being separated from each other and said web being sealable in the electrolytic apparatus between adjacent cells thereof so as to separate such cells.

4,137,146
TWO-STAGE HYDROCONVERSION PROCESS (HYDROCRACKING AND REFORMING) USING A STABILIZED ALUMINOSILICATE HYDROCRACKING CATALYST

Jarold A. Meyer, Concord, Calif., assignor to Chevron Research Company, San Francisco, Calif.

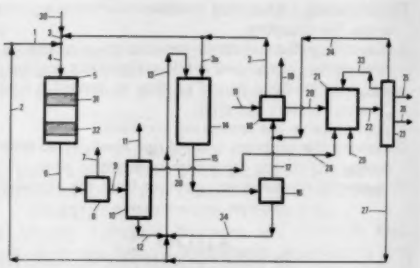
Continuation-in-part of Ser. No. 586,674, Jun. 13, 1975, abandoned. This application Feb. 16, 1977, Ser. No. 769,625
Int. Cl.[2] C10G *37/00*
U.S. Cl. 208—60 13 Claims

1. In a process for the production of a product comprising reformed cracked gasoline from a substantially paraffinic hydrocrackable hydrocarbon feed, containing less than 10 volume percent aromatics, by the steps comprising hydrocracking and reforming, said hydrocracking being effected under ordinary hydrocracking conditions, including a temperature in the range 400°–850° F. and a hydrogen rate of 1,000–20,000 SCF per barrel of said feed, by contacting said feed with a substantially porous hydrocracking catalyst composite, said composite having a surface area of 50 to 700 square meters per gram, said composite comprising an amorphous simultaneously cogelled silica-alumina cracking base component and at least one catalytic hydrogenation component selected from the group consisting of noble elements of Group VIII of the Periodic Chart of the Atoms, said cracking base component containing at least 80 weight percent amorphous silica-alumina of which the alumina content is in the range from about 30 to 98 weight percent and the balance thereof comprises at least one inorganic refractory oxide selected from the group consisting of oxides of Group II and of the other refractory oxides of Groups III and IV, said elements being present in said composite in at least one form selected from the group consisting of oxides and sulfides and the metal, thereby producing a hydrocarbon hydrocrackate; said reforming being effected by contacting at least a substantial portion of said hydrocrackate with an ordinary reforming catalyst under ordinary catalytic reforming conditions, including a temperature in the range 700°–1,000° F., thereby producing said gasoline products, the improvement comprising carrying out said hydrocracking using a stabilized catalytic cracking composite, said stabilization being obtained by admixing an organic-metal compound precipitate with a freshly prepared gelatinous silica-alumina precursor of said cogelled cracking base component, said precipitate resulting from the interaction, by complex compound formation of metathesis, of a water-soluble compound of at least one of said elements with at least one organic gravimetric reagent therefor, said reagent and compound exhibiting a solubility product, Ksp, of less than about 10^{-3}, and converting the resulting mixture into said stabilized catalyst, said converting comprising at least a step of calcining by maintaining said resulting mixture at a temperature in the range of from about 500° F. to 1,800° F. for a period sufficient for expelling volatile portions of the mixture and in the range of from about 1 to 48 hours.

4,137,147
PROCESS FOR MANUFACTURING OLEFINIC HYDROCARBONS WITH RESPECTIVELY TWO AND THREE CARBON ATOMS PER MOLECULE

Jean-Pierre Franck, Bougival; Edouard Freund, Rueil Malmaison; Christian Marcilly, Houilles, and Jean Miquel, Paris, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sep. 16, 1977, Ser. No. 834,025
Claims priority, application France, Sep. 16, 1976, 76 28245; Oct. 4, 1976, 76 29992
Int. Cl.[2] C07C *3/34;* C10G *13/04, 37/04*
U.S. Cl. 208—61 16 Claims



1. A process for manufacturing ethylene and propylene from a charge having a distillation point lower than about 360° C. and containing at least normal and iso-paraffins having at least 4 carbon atoms per molecule, wherein:

(a) said charge is subjected to a hydrogenolysis reaction in a hydrogenolysis zone, in the presence of a catalyst of the acid mordenite type with at least 0.01 to 25% b.w. of at least one group VIII metal,

(b) the effluents from the hydrogenolysis reaction are fed to a separation zone from which are discharged (α), from the top, methane and possibly hydrogen, (β) a fraction consisting essentially of hydrocarbons with 2 and 3 carbon atoms per molecule, and (λ), from the bottom, a fraction consisting essentially of hydrocarbons with at least 4 carbon atoms per molecule,

(c) only said fraction consisting essentially of hydrocarbons with 2 and 3 carbon atoms per molecule is fed to a steam-cracking zone, in the presence of steam, to transform at least a portion of the hydrocarbons with 2 and 3 carbon atoms per molecule to monoolefinic hydrocarbons; said fraction consisting essentially of hydrocarbons with at least 4 carbon atoms per molecule, obtained from the bottom of said separation zone, is supplied to a second hydrogenolysis zone where it is treated in the presence of a catalyst containing at least 0.01 to 25% b.w. of at least one metal of group VIII, VI B or VII B, the effluent from

the second hydrogenolysis zone is supplied to a separation zone to discharge, on the one hand, hydrocarbons with at least 4 carbon atoms per molecule which are recycled at least partly to the said second hydrogenolysis zone, and, on the other hand, a fraction consisting essentially of a mixture of hydrogen, methane and saturated hydrocarbons with 2 and 3 carbon atoms per molecule; a hydrogen stream and a methane stream are separated from said mixture and there is fed to said steam-cracking zone the hydrocarbons of said mixture with 2 and 3 carbon atoms, together with said fraction consisting essentially of hydrocarbons with 2 and 3 carbon atoms per molecule as recovered from said separation zone following the first hydrogenolysis zone, and there are thus obtained at the outlet of the steam-cracking zone, in addition to a stream of methane and hydrogen and a stream of paraffinic hydrocarbons with 2 and 3 carbon atoms per molecule, on the one hand, olefins with 2 and 3 carbon atoms per molecule and, on the other hand, products with at least 4 carbon atoms per molecule.

4,137,148

MANUFACTURE OF SPECIALTY OILS

Bernard M. Gillespie, Pitman; Michael S. Sarli, Haddonfield, and Kenneth W. Smith, Woodbury, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 20, 1977, Ser. No. 817,309

Int. Cl.[2] C10G *21/00, 37/06*

U.S. Cl. 208—87 **11 Claims**

1. A process for preparing high quality specialty oil from waxy crude oil which comprises separating from said waxy crude a distillate fraction thereof having an initial boiling point of at least about 450° F. and a final boiling point less than about 1050° F., extracting said distillate fraction with a solvent selective for aromatic hydrocarbons to yield a raffinate from which undesirable compounds have been removed, catalytically dewaxing the raffinate in the presence of hydrogen to a pour point not higher than about −30° F. by contacting said raffinate at a temperature of 500° to 675° F. with a dewaxing catalyst comprising an aluminosilicate zeolite having a silica/alumina ratio above 12 and a constraint index between 1 and 12 thereby forming dewaxed raffinate and lower boiling hydrocarbons, hydrotreating the dewaxed raffinate by contact at a temperature of 425° to 600° F. with a hydrotreating catalyst comprising a hydrogenation component on a non-acidic support, and topping the raffinate subsequent to dewaxing to remove therefrom said lower boiling hydrocarbons, whereby directly recovering substantially all of the remainder of said dewaxed raffinate, said remainder having a pour point not higher than about −30° F.

4,137,149

SLURRY HYDROGEN TREATING PROCESSES

David E. Allan; William E. Lewis, and William J. Metrailer, all of Baton Rouge, La., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jun. 29, 1977, Ser. No. 810,913

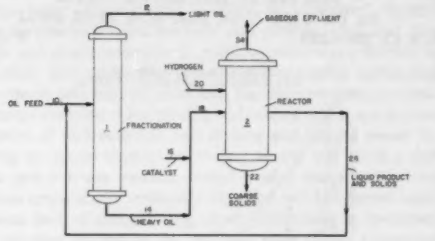
Int. Cl.[2] C10G *13/18, 23/10*

U.S. Cl. 208—93 **11 Claims**

1. In a slurry hydrogen treating process wherein a hydrocarbonaceous oil is separated into fractions, including a heavy oil fraction, in a separation zone, and wherein a slurry of said heavy oil and particulate solids is hydrogen treated in a hydrogen treating zone at hydrogen treating conditions, in the presence of hydrogen and the resulting normally liquid product comprising a lighter oil, a heavier oil and solids is removed from the hydrogen treating zone, the improvement which comprises:

(a) passing at least a portion of said liquid product, without intervening distillation, to said separation zone, said portion of liquid product comprising at least a portion of said light oil, at least a portion of said heavy oil and solids having a particle size up to about 50 microns in diameter,

(b) separating said portion of liquid product with said hydrocarbonaceous oil in said separation zone to produce said fractions, and



(c) removing a separate portion of solids from said hydrogen treating zone, the solids of said separate portion of solids having a particle size greater than 50 microns in diameter.

4,137,150

METHOD FOR THE MANUFACTURE OF A COAL-TAR PITCH COKE

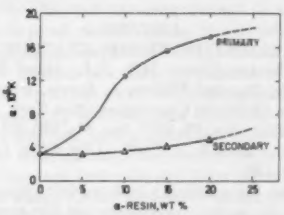
Gerhard Pietzka, Vockenhausen, Taunus, and Harald Tillmanns, Kelkheim, both of Germany, assignors to Sigri Elektrographit GmbH, Meitingen bei Augsburg, Germany

Filed Jul. 20, 1977, Ser. No. 817,238

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1976, 2635451

Int. Cl.[2] C10B *55/00*; C01B *31/02*

U.S. Cl. 208—106 **3 Claims**

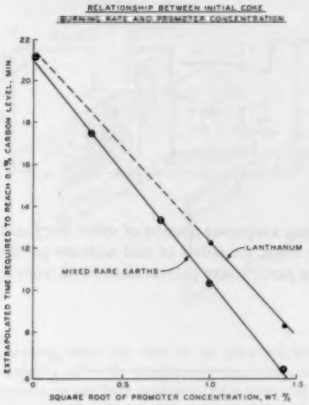


1. In a method for the manufacture of coal-tar pitch coke from coal-tar pitch by heating the pitch to a temperature up to about 1300° C. to convert the pitch to coke, the improvement comprising producing coke with a predetermined degree of anisotropy and thermal volume expansion coefficient by adjusting primary resin content which are components of a coal-tar pitch which are insoluble in quinoline and have a hydrogen content which is $< 2\%$, and secondary resin content which are components of a coal-tar pitch which are insoluble in quinoline and have a hydrogen content which is $> 3\%$, in the pitch to produce a coke having desired degree of anisotropy of the linear thermal expansion coefficients and thermal volume expansion coefficient, wherein the pitch prior to coking is subjected to a separation treatment to remove solid particles therefrom and primary resin and secondary resins are added to the pitch after separation treatment to effect said adjusting of primary resin content and secondary resin content in the pitch.

4,137,151
HYDROCARBON CONVERSION WITH CRACKING CATALYST HAVING CO-COMBUSTION PROMOTERS LANTHANUM AND IRON

Sigmund M. Csicsery, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 25, 1977, Ser. No. 772,170
Int. Cl.[2] C10G *11/04;* B01J *8/24, 27/28, 29/12*
U.S. Cl. 208—120 5 Claims


RELATIONSHIP BETWEEN INITIAL COKE BURNING RATE AND PERIMETER CONCENTRATION
EXTRAPOLATED TIME REQUIRED TO REACH 0.1% CARBON LEVEL, MIN
SQUARE ROOT OF PROMOTER CONCENTRATION, WT %
LANTHANUM
MIXED RARE EARTHS

1. A process for catalytically cracking a hydrocarbon feedstock which comprises contacting said feedstock with a catalyst composition comprising 1 to 80 weight percent of a zeolitic crystalline aluminosilicate, 0.05 to 10 weight percent lanthanum, calculated as the elemental metal and excluding lanthanum in the crystal structure of said aluminosilicate, and 0.05 to 10 weight percent iron, calculated as the elemental metal and excluding iron in the crystal structure of said zeolite and excluding iron deposited on said catalyst composition during catalytic use, said lanthanum, iron and aluminosilicate being dispersed in a porous, refractory matrix, at catalytic cracking conditions including a temperature in the range from 800° F. to 1300° F.

4,137,152
SELECTIVE HIGH CONVERSION CRACKING PROCESS

Arthur W. Chester, Cherry Hill, N.J.; Albert B. Schwartz, Philadelphia, Pa., and William A. Stover, Woodbury, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,183
Int. Cl.[2] B01J *8/24;* C10G *11/04;* C07C *15/02*
U.S. Cl. 208—120 15 Claims

1. A process for cracking a hydrocarbon chargestock containing aromatic nuclei components and non-aromatic nuclei components which comprises contacting said chargestock with a catalyst composition:

(1) characterized by an alkali metal content of less than about 1.5 weight percent and

(2) comprising a mixture of faujasite and mordenite in which the weight ratio of faujasite to mordenite is within the approximate range of 30:1 to 1:5

said contacting taking place under catalytic cracking conditions, including a temperature in the range of about 900° to about 1200° F., a pressure between about atmospheric and about 100 psig, an oil contact time between about 0.5 second and about 15 minutes and a catalyst to oil ratio of between about 1 and about 20, the activity of said catalyst and said conditions being controlled such that severity of the conversion level exceeds that attributable to conversion of the non-aromatic nuclei portion of said charge stock with a resultant coke yield lower than that obtainable with the same catalyst in the absence of mordenite at the same level of conversion.

4,137,153
HYDROCARBON CONVERSION WITH AN ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 833,332, Sep. 14, 1977. This application Mar. 3, 1978, Ser. No. 883,115
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 5 Claims

1. A process for converting a hydrocarbon which comprises contacting said hydrocarbon with a catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state, and of a zinc component.

4,137,154
PROCESS FOR THE REMOVAL OF NITROGEN COMPOUNDS FROM VARIOUS ORGANIC MEDIA

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

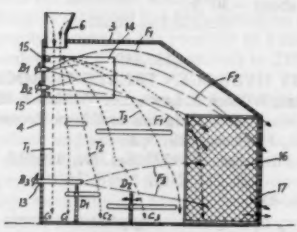
Filed Jul. 5, 1977, Ser. No. 812,950
Int. Cl.[2] C10G *17/00*
U.S. Cl. 208—254 R 23 Claims

1. A process for effecting the removal of undesirable nitrogenous compounds from liquid organic media comprising contacting said organic media under removal conditions at a temperature below the boiling point of the organic media with a solid sorbent wherein said sorbent is selected from the group consisting of crystalline and amorphous forms of silica, bauxite, X and Y zeolites, alumina, silica-alumina and mixtures of silica and alumina having an effective amount of from about 0.001–20 weight percent of an anhydrous acid gas selected from the group consisting of hydrogen bromide and hydrogen chloride adsorbed therein until substantially all of said undesirable compounds are removed from said organic media.

4,137,155
METHOD OF AND APPARATUS FOR PNEUMATICALLY SORTING HETEROGENEOUS MIXTURES

François Clin; Jean-Nöel Gony, both of Orleans, and François Proust, Olivet, all of France, assignors to Bureau de Recherches Geologiques et Minieres, Paris Cedex, France

Filed Apr. 27, 1977, Ser. No. 791,445
Claims priority, application France, Apr. 27, 1976, 76 12437
Int. Cl.[2] B07B *4/02*
U.S. Cl. 209—134 3 Claims



1. An apparatus for pneumatically sorting heterogeneous objects of different shapes and densities comprising sorting chamber means having top, side and end walls, open ended vertical hopper means supported on said chamber means and extending through said top wall adjacent one end wall, first air jet means extending through said one end wall in spaced relation to the bottom of said vertical hopper means for directing at least one horizontal jet of air toward the other end wall across the open bottom of said hopper means, outlet means in said chamber adjacent the lower end of said other end wall, at

least one vertical partition extending between said side walls to define a plurality of bins, mounting means for adjustably and removably securing each partition to said side walls at selected locations intermediate said end walls and second jet means mounted on the top of the partition closest to said one end wall and spaced below said first jet means for directing a horizontal jet of air toward said other end wall to impart a further lateral impulse to those objects which were previously diverted by said first jet means from their vertical downward path as they emerged from said vertical hopper means, roller means rotatably mounted parallel to the top of said partition above said second jet means to prevent falling objects from lodging on top of said partition and interfering with said second jet means and two deflectors mounted on said one end wall for rotation about vertical axes on opposite sides of said first jet means for laterally containing the expansion of the air jets carrying the objects to be sorted.

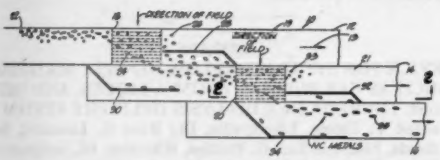
4,137,156
SEPARATION OF NON-MAGNETIC CONDUCTIVE METALS

Booker W. Morey, Pasadena, and Samuel Rudy, Pomona, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation of Ser. No. 560,972, Mar. 21, 1975, abandoned, which is a continuation of Ser. No. 449,823, Mar. 11, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,784

Int. Cl.[2] B03C *1/16*

U.S. Cl. 209—212 **8 Claims**



1. A method of separating relatively large non-magnetic conductive components from a mixture of non-magnetic conductive metal components and non-magnetic non-conductive material, including the steps of:

generating a traveling electromagnetic wave from a linear motor stator with a frequency from about 400 to about 800 cycles per second;

passing a stream of a mixture of non-magnetic conductive metal components of a size at least about ¼ inch and non-magnetic non-conductive material through said traveling wave along the face of the linear motor stator on a moving belt spacing the mixture from said stator, with the direction of the linear motor traveling wave generally perpendicular to the direction of the stream of mixture, inducing eddy currents in the conductive metal components of the mixture producing forces acting on the conductive metal components in the direction of the traveling wave and moving conductive metal components from the stream along paths parallel to the stator face at a velocity substantially less than the velocity of the traveling wave; and

collecting the components which are moved by the forces acting in the direction of the traveling wave.

4,137,157
SCREEN TENSION ASSEMBLY FOR VIBRATORY SCREENING APPARATUS

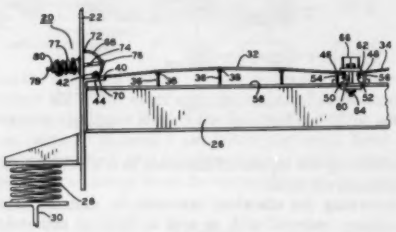
Emil E. Deister, and Emil M. Deister, both of Fort Wayne, Ind., assignors to Deister Machine Company, Inc., Fort Wayne, Ind.

Filed Oct. 12, 1976, Ser. No. 731,759

Int. Cl.[2] B07B *1/49*

U.S. Cl. 209—403 **19 Claims**

18. In particulate material-screening apparatus including a frame having spaced, parallel, upstanding side panels connected by a support structure having openings therein for passing screened material, two extended area apertured screens supported on said panels for separating finer from coarser material and respectively having opposite side edges, means for securing one side edge of each said screen to said frame adjacent a respective side panel, the other side edges of said screens being adjacent and defining an elongated, narrow space therebetween intermediate and parallel with said side panels, and down-turned hook portions respectively formed at said other side edges and respectively engaging upstanding elements on said support structure; the improvement comprising means for removably closing and sealing said space against the entry of said material, said closing and sealing means including an upper element extending across and closing said space, and a lower element seated in said space and having portions respectively resiliently engaging said last-named hook portions, each of said securing means comprising an up-turned hook portion formed at the one side edge of the respective



screen, each of said securing means comprising a clamping member having opposite ends with one end normally engaging the respective up-turned hook portion and the other end normally engaging the respective side panel, a stud having one end connected to said clamping member intermediate said ends thereof and its other end extending through an aperture in the respective side panel, resilient means on said other end of said stud and engaging the respective side panel for urging said stud in a direction to cause said clamping member to apply tension on the respective screen, means on said clamping member for pivotally connecting said other end thereof to the respective side panel so that said clamping member may be pivoted upwardly away from the respective screen to a stored position thereby to disengage said other end from the respective hook portion, and wedge means removably seated in a slot in said other end of said stud and normally engaging and compressing said resilient means whereby removal of said wedge means permits removal of said resilient means from said other end of said stud so that said clamping member may be pivoted to said stored position.

4,137,158
PROCESS FOR TERTIARY TREATMENT OF WASTE WATERS FROM ANAEROBIC DIGESTION TREATMENT PROCESS

Masahiko Ishida; Ryooichi Haga, and Youji Odawara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 22, 1976, Ser. No. 753,207

Claims priority, application Japan, Dec. 25, 1975, 50-156248

Int. Cl.[2] C02B *1/20*; C02C *1/14*

U.S. Cl. 210—16 **4 Claims**

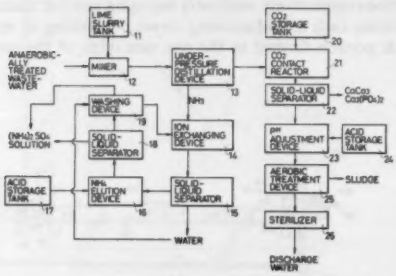
1. A process for reducing BOD, nitrogen and phosphorus concentration from the effluent produced in the liquid-solid separation of anaerobically digested biochemical waste solu-

tion having in it ammonia and phosphorous, comprising the steps of:

(1) anaerobically digesting biochemical waste having phosphorous and nitrogen to produce carbon dioxide gas and anaerobically digested biochemical waste and thereafter separating by solid-liquid separation the anaerobically digested biochemical waste into anaerobically digested sludge and effluent having ammonia and phosphorous,

(2) adding lime to the effluent to render the pH of the effluent within the range of 10.3 to 11.0 and to form calcium phosphate with said phosphorus,

(3) separating ammonia in the form of aqueous ammonia distillate from the effluent by reduced pressure distillation at a pressure of 200 mm Hg or lower,



(4) adsorbing the separated ammonia in a weakly acidic ion exchange material,

(5) desorbing the adsorbed ammonia by reacting said ion exchange material with an acid to form an ammonia salt and regenerate the ion exchange material,

(6) blowing the carbon dioxide gas that was produced in step (1) into the effluent from which ammonia has been removed at the step (3), to form calcium carbonate, precipitate the calcium phosphate, formed in step 2, with the calcium carbonate, and separating said precipitate from the effluent, and

(7) subjecting the effluent from which the precipitate has been separated at the step (6), to aerobic digestion treatment within a pH range of 6.0–7.5 for removing said BOD therefrom.

4,137,159

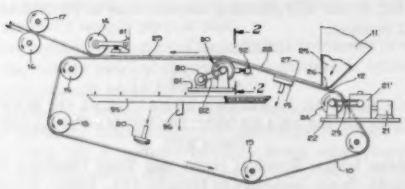
APPARATUS AND METHOD FOR DELIQUIFYING MATERIAL

Harold T. Sawyer, Pacific Palisades, Calif., assignor to Vernon D. Beehler, Los Angeles, Calif., a part interest

Continuation-in-part of Ser. No. 573,043, Apr. 30, 1977, abandoned. This application Sep. 26, 1977, Ser. No. 836,537

Int. Cl.[2] B01D *35/20*

U.S. Cl. 210—19 **17 Claims**



1. An apparatus for deliquifying a belt carried fluid suspension of material and separating fluid therefrom comprising an endless porous belt in a path of travel at a selected linear speed, feed means for said material having an outlet adjacent an upwardly directed face of the belt, a collecting means beneath the opposite face of the belt, and a frequency generator assembly, said frequency generator assembly comprising an exterior cylindrical roll with an axis of rotation parallel to said belt and having a circular cross sectional shape with a substantially smooth exterior surface, said exterior surface being in continuous progressive face to face engagement with said opposite face of the belt, said exterior cylindrical roll having a selected resonant frequency, said smooth exterior surface of the roll having a path of travel in the same direction as and corresponding to the path of travel of the belt, a first drive means for said exterior cylindrical roll operable to drive the smooth exterior surface at substantially the same linear speed as said belt, means rotatably supporting said frequency generator assembly, a generator roll member inside and substantially concentric with the exterior cylindrical roll, a generator shaft substantially concentric with the axis of rotation of the exterior cylindrical roll, and a separate drive means for said generator shaft adapted to drive said generator shaft in a selected direction of rotation relative to said exterior cylindrical roll, and at a speed of rotation different from the speed of rotation of said exterior cylindrical roll, an eccentric connection between said generator shaft and said generator roll member peoductive of a sinusoidal vibration condition in said generator roll, said generator roll member having a connection to said exterior cylindrical roll at an antinodal point for one of the modes of resonant frequency of said exterior cylindrical roll, operation of said generator roll member being productive of a sinusoidal vibration condition in said exterior cylindrical roll in the sonic range at resonance, whereby to set adjacent portions of said belt sinusoidally at resonance and excite the material thereon in a condition of cavitation.

4,137,160

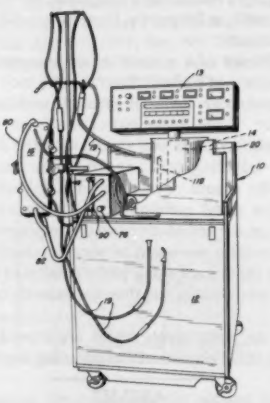
DEVICE FOR SEPARATING LOW DENSITY MATERIAL SUCH AS GAS BUBBLES FROM A LIQUID, AND THE USE THEREOF IN A DIALYSIS DELIVERY SYSTEM

Wendell V. Ebling, Libertyville, Ill.; Rene G. Lamadrid, Bethesda, Md., and Earl G. Phillips, Wheeling, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 519,730, Oct. 31, 1974, abandoned. This application Nov. 8, 1976, Ser. No. 739,878

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—22 A **10 Claims**



1. In a dialysis delivery system which comprises a dialysis solution source, means for conveying dialysis solution from said source to a dialysis unit at a predetermined pressure and rate of flow, the improvement comprising: bubble separation apparatus positioned in flow communication with said dialysis solution source and said dialysis unit for removing any gas bubbles in said dialysis solution before they reach said dialysis unit, said bubble separation apparatus comprising a liquid storage chamber having side walls of generally circular cross-

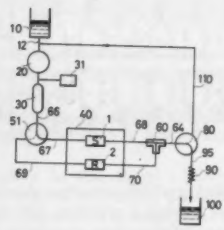
section about a longitudinal axis, and a port for removing said bubbles positioned adjacent the longitudinal axis of said chamber, said device also having a liquid inlet to said chamber which is positioned to pass liquid into said chamber circumferentially about said side walls, to provide swirling of liquid passing into said chamber, outlet and positive pressure pump means for removing bubble-free liquid from said chamber at a point spaced from said inlet but adjacent said side wall; liquid heating means positioned in said chamber to heat said swirling liquid to increase gas bubble generation; first conduit means for conveying a portion of bubble-free liquid so removed to a desired site of use and thereafter to a drain line, and second conduit means for conveying the balance of said bubble-free liquid so removed to the liquid inlet for reentry into the chamber, to enhance swirling action of fluid in said chamber.

4,137,161

LIQUID CHROMATOGRAPH APPARATUS

Mitsuo Shimada, and Yoshio Fujii, both of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 28, 1977, Ser. No. 763,673
Claims priority, application Japan, Jan. 30, 1976, 51-8530
Int. Cl.² B01D *15/08*
U.S. Cl. 210—31 C **13 Claims**



13. A liquid chromatograph method, comprising the steps of: passing a liquid through a reference cell of a detector to clear the reference cell of gas bubbles; closing one of an inlet and outlet of said reference cell while the liquid is filled in said reference cell; maintaining direct fluid communication between a sample cell of said detector and the other of said inlet and outlet of said reference cell to maintain substantially identical pressures in said sample cell and said reference cell while simultaneously providing a resistance to a fluid flow of an effluent from said sample cell to provide the same back pressure to both said sample cell and said reference cell and isolate said sample cell and said reference cell from changes in atmospheric pressure; passing an eluent with a sample therein through a separation column to separate the sample into its components; thereafter passing the eluent from said separation column with the separated components of the sample therein through said sample cell during said steps of maintaining and providing; and passing light rays through said reference cell with its contained liquid and said sample cell as the separated sample passes therethrough and measuring the effect upon the light rays of said reference cell and sample cell, respectively.

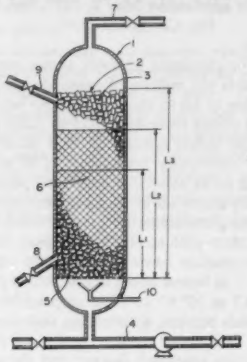
4,137,162

METHOD FOR TREATING WASTE WATERS

Michihiro Mohri; Hiroo Takeda; Masaaki Tsunemi, all of Kawasaki; Tadashi Uchiumi, Tokyo, and Takeshi Kanda, Sagamihara, all of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Sep. 6, 1977, Ser. No. 830,782
Claims priority, application Japan, Sep. 10, 1976, 51-107721
Int. Cl.² B01D *15/00*; C02B *1/14*
U.S. Cl. 210—40 **10 Claims**

1. A method for treating waste waters to remove oils and/or COD therefrom, which comprises accomodating solid porous packing pieces and activated carbon particles in a container, the porous packing pieces forming a stationary porous packed bed, the average pore diameter of the porous packing pieces being 1.5 to 8 times the average diameter of the activated carbon particles; introducing a waste water from the bottom portion of the container to fluidize the activated carbon particles within the pores of the porous packing pieces and in spaces



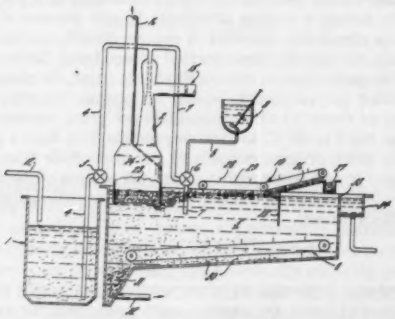
among the adjoining porous packing pieces and simultaneously to contact the waste water with the activated carbon particles; maintaining the upper level of the fluidized bed of the activated carbon particles at least 5 cm below the upper level of the porous packed bed; and withdrawing the waste water which has been so contacted from the top portion of the container.

4,137,163

TREATMENT OF VEGETABLE TANNING WASTES

Harland H. Young, Western Springs, Ill., assignor to Eberle Tanning Company, Westfield, Pa.

Filed Jul. 18, 1977, Ser. No. 816,498
Int. Cl.² C02B *1/20*; C02C *5/02*
U.S. Cl. 210—44 **6 Claims**



1. A process for removing suspended solids and color bodies from alkaline liquid tannery waste effluent containing colored vegetable extract tannin bodies which comprises the steps of:

(a) treating the effluent with at least about 4ppm of a polyacrylamide flocculant;

(b) scrubbing a hot combustion gas with the treated effluent from (a) to at least partially reduce the alkalinity of said effluent and to produce floatable foam that entraps non-settleable floc, said scrubbing being continued until the temperature of said effluent is raised to at least about 85° F and the alkalinity of said effluent is reduced to a pH below about 10;

(c) separating floatable and settleable matter from the effluent.

4,137,164

PROCESS FOR CLARIFYING IRON ORE SLIMES

Anthony T. Coscia, South Norwalk, and Michael N. D. O'Connor, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 735,577, Oct. 26, 1976, abandoned. This application May 2, 1977, Ser. No. 792,744

Int. Cl.[2] B01D *21/01*

U.S. Cl. 210—54 5 Claims

1. A process for clarifying iron ore slimes containing up to about 100,000 parts per million of suspended inorganic solids with a particle size of up to about 2 microns which comprises mixing with said slimes from about 0.1 to 1,000 parts per million, based on the solids content of said slimes, of a water soluble polymer consisting essentially of a polyacrylamide having a content of at least about 50 mol percent of amide groups chemically-modified to contain dimethylaminomethyl groups, the dimethylaminomethyl groups being further modified by quaternization with an alkylating agent, the chemically-modified polyacrylamide having an intrinsic viscosity in the range of about 0.1 to below about 0.5 deciliters per gram measured in 3M NaCl at 30° C. to form suspendible flocs from a portion of the solids present, maintaining said suspendible flocs in suspension in said water until a substantial portion of the remaining solids are adsorbed thereo; and thereafter settling the resulting flocs formed.

4,137,165

PROCESS FOR CLARIFYING RAW WATER

Anthony T. Coscia, South Norwalk, and Michael N. D. O'Connor, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 735,577, Oct. 26, 1976, abandoned. This application May 2, 1977, Ser. No. 792,746

Int. Cl.[2] B01D *21/01*

U.S. Cl. 210—54 5 Claims

1. A process for clarification of raw water from natural waterways containing up to about 10,000 ppm of suspended inorganic solids of a particle size up to about 2 microns which comprises: mixing with said water from about 0.1 to 20 ppm of a water soluble polymer consisting essentially of a polyacrylamide having a content of at least 50 mol percent of amide groups chemically modified to contain dimethylaminomethyl groups, the dimethylaminomethyl groups being further modified by quaternization with an alkylating agent, the chemically-modified polyacrylamide having an intrinsic viscosity in the range of about 0.1 to 0.45 deciliters per gram, measured in 3 molar NaCl at 30° C. to form suspendible flocs from a portion of the solids present; maintaining the suspendible flocs in suspension in said water until a substantial portion of the remaining solids is adsorbed thereto; and thereafter settling the resulting flocs formed.

4,137,166

PROCESS FOR THE PURIFICATION OF WASTE WATER CONTAINING AMMONIA AND AMMONIUM SALTS

Werner Heimberger, Hanau, and Hermann Schmitt, Rodenbach, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed May 20, 1977, Ser. No. 798,949

Claims priority, application Fed. Rep. of Germany, May 29, 1976, 2624256

Int. Cl.[2] C02B *1/36*

U.S. Cl. 210—62 15 Claims

1. A process for the purification of ammonia or ammonium salt containing waste water using an alkali metal or alkaline earth metal hypochlorite, said waste water having a pH below 8, comprising initially raising the pH of the waste water to an initial pH of 8–10.5 with an alkaline material and then treating the waste water with an alkali metal or alkaline earth metal hypochlorite in an amount equivalent to the ammonia or ammonium salt to an amount up to 5% in excess of the equivalent amount of ammonia or ammonium salt, the equivalent of hypochlorite to ammonia or ammonium salt being 3 moles of OCl^- to 2 moles of NH_3 or NH_4^+ according to the following equation:

$$2NH_4Cl + 3NaOCl \rightarrow N_2 + 3NaCl + 3H_2O + 2HCl,$$

so as to convert substantially all of the NH_3 or NH_4^+ to nitrogen without the formation of nitrogen trichloride, and allowing the nitrogen formed in the reaction to evolve.

4,137,167

REMOVAL OF MOISTURE FROM A SLUDGE SLURRY OR THE LIKE

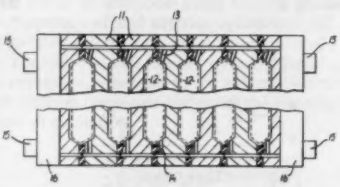
Jack Kenyon, Goostrey, and Herbert M. Heaton, Whaley Bridge, both of England, assignors to The Moseley Rubber Company Limited, Manchester, England

Filed Jan. 21, 1977, Ser. No. 761,244

Claims priority, application United Kingdom, Jan. 23, 1976, 2617/76

Int. Cl.[2] B01D *25/12*

U.S. Cl. 210—81 8 Claims



1. A method of filtering which comprises the steps of providing a press structure having a plurality, but not more than twenty, of press plates defining press chambers, charging such structure with a sludge, slurry or the like, physically compressing material within the chambers to express liquid therefrom and form a coherent mass of not more than nineteen millimeters thickness when compressed, opening all of the press chambers simultaneously when said press structure is opened substantially to its full extent, and removing the compacted cakes therefrom.

5. A plate filter press having a plurality of vertically disposed filter plates defining less than twenty relatively shallow filter lined filter chambers and having membranes to effect physical compression of cake not more than nineteen millimeters in thickness in said chambers, means linking adjacent plates together for providing simultaneous opening of all of said chambers when the press is opened substantially to its full extent following a sequential one at a time opening of said chambers, and means for facilitating said cake to separate from said chambers as a consequence of the opening the press.

4,137,168

DEVICE FOR DIALYSATION OF BLOOD

Erwin Perrot, Schwalbach, Fed. Rep. of Germany, assignor to Klauschenz & Perrot KG, Schwalbach, Fed. Rep. of Germany

Filed Sep. 30, 1977, Ser. No. 838,389

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644584

Int. Cl.[2] D01D *13/00, 31/00*

U.S. Cl. 210—96 M 14 Claims

1. In apparatus for use in blood dialysis, the apparatus including means for the continuous automatic production of dialysis fluid and the transport of such fluid through a chamber whereby impurities in the blood may be transferred to the fluid, the improvement comprising:

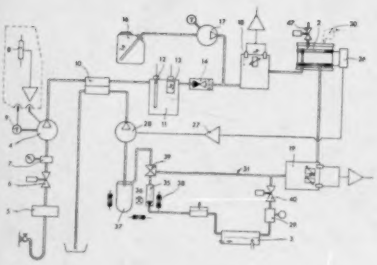
first pump means, said first pump means being adapted to be connected to a source of water;

a buffer container;

means for controllably mixing a dialysis fluid concentrate with water passing through said first pump means to provide dialysis fluid having a desired concentration, said mixing means connecting the discharge of said first pump means to said buffer container;

means for controlling said first pump means to cause a predetermined amount of dialysis fluid to be delivered to said buffer container per unit of time;

means coupling said buffer container to the dialysis chamber whereby dialysis fluid from said buffer container may be passed through said chamber;



second pump means, said second pump means being connected in the dialysis fluid transport circuit downstream of the dialysis chamber;

means for measuring the quantity of fluid in said buffer container and generating a signal commensurate therewith; and

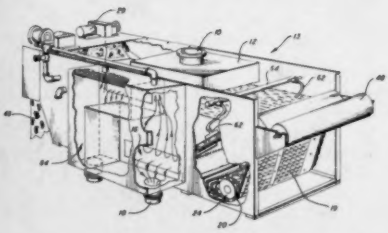
means responsive to said signal commensurate with the quantity of fluid in said buffer container for controlling said second pump means to maintain a constant quantity of dialysis fluid in said buffer container.

4,137,169

LIQUID FILTRATION SYSTEM

Ahmad M. El-Hindi, Fabius, N.Y., assignor to Filter Tech, Inc., Manlius, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,537
Int. Cl.[2] B01D *29/02*
U.S. Cl. 210—97 **4 Claims**



1. In filter apparatus for separating solid contaminants from liquids of the type having a tank defining an upper compartment with a liquid inlet and a lower compartment with a liquid outlet in fluid communication with said upper compartment, and an endless, flexible, liquid-permeable filter element supported for movement in a path between said upper and lower compartments and separating said upper and lower compartments to allow passage of liquid through said filter element from said upper to said lower compartment, the improvement therein of means for withdrawing filtered liquid at a substantially constant rate, said means comprising:

(a) pump means for removing liquid through said outlet at a substantially constant rate, thereby forming a first vacuum chamber in a portion of said lower compartment immediately below said filter element;

(b) a vacuum compartment in fluid communication at its lower end with said lower compartment and constructed and arranged with its upper end providing a second vacuum chamber above the level of said first vacuum chamber;

(c) a vacuum pump;

(d) a conduit connecting said vacuum pump with said second vacuum chamber for evacuating air therefrom;

(e) a throttle valve in said conduit; and

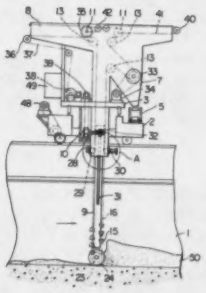
(f) liquid level sensing means in said upper end of said vacuum compartment constructed and arranged to reduce the opening of said throttle valve in response to rise of the liquid level in said vacuum compartment upper end and to increase the opening of said throttle valve in response to lowering of the liquid level in said vacuum compartment upper end.

4,137,170

TRAVELLING PRECIPITATE COLLECTOR

Yasuo Tateishi, Kumagaya, Japan, assignor to Hita Chi Metals, Ltd., Japan

Filed Feb. 17, 1977, Ser. No. 769,772
Claims priority, application Japan, Feb. 20, 1976, 51/17060
Int. Cl.[2] B01D *21/20*
U.S. Cl. 210—112 **23 Claims**



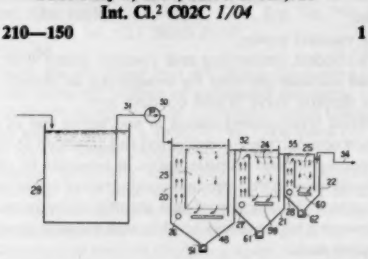
1. A travelling precipitate collector which comprises a longitudinally travelling frame body capable of travelling over a plurality of sedimentation basins, a transversely travelling frame body capable of travelling on said longitudinally travelling frame body, an elevating frame vertically movably provided in a machine frame fixed on said transversely travelling frame body, said elevating frame capable of having a bending moment as the collector collects precipitate which varies in proportion to the volume of the precipitate accumulated at the bottom of a sedimentation basin, a chain rotatably provided which is capable of circulating through said machine frame and the elevating machine, a plurality of buckets fixedly provided on the chain, at least one pressure detector provided in a portion of said machine frame so as to abut against said elevating frame through urging means, transversely travelling drive means for causing said transversely travelling frame body to travel, and control means, responsive to said pressure detector, for controlling the speed at which said transversely travelling drive means causes said transversely travelling frame body to travel, whereby variation of the bending moment of said elevating frame is detected by means of said detector and travelling speed of said transversely travelling frame body is controlled responsive to this variation.

4,137,171

PROCESS FOR TREATING WASTE WATER AND AN APPARATUS THEREFOR

Ittshu Yokata, Zentsuji, Japan, assignor to Ishigaki Kiko Co., Ltd., Tokyo, Japan, a part interest

Filed May 3, 1974, Ser. No. 466,718
Int. Cl.² C02C *1/04*
U.S. Cl. 210—150 **1 Claim**



1. The apparatus for treating waste water comprising at least one treating tank having an inlet for waste water and an outlet for treated water; at least one net assembly which is composed of a plurality of horizontally extending net units arranged in said treating tank in parallel with vertical intervals therebetween of between 5 and 30 millimeters, each of said net units being composed of at least one net having openings therethrough, each of the openings being in the form of polygons having sides of at least five millimeters; and means for moving waste water relative to the net units through said net assembly in the direction perpendicular to the surfaces of the net units at a rate of about one centimeter per second, said means for moving waste water relative to the net units is constructed so that the said means forcedly flows the waste water in said perpendicular direction through said net assembly from the top of the assembly toward the bottom of the assembly, the apparatus further including means for scraping off sludge from the upper surface of the uppermost net unit comprising a net which is intermittently reciprocated to move on and along the upper surface of the uppermost net unit.

4,137,172

ROTATING BIOLOGICAL CONTACTOR

Fumio F. Sako, San Jose, and Christopher C. Pearson, Woodside, both of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Aug. 17, 1977, Ser. No. 825,220
Int. Cl.² C02C *5/10*
U.S. Cl. 210—150 **4 Claims**

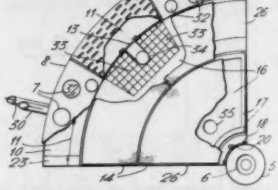
1. Apparatus for treating sewage, or the like, including a tank containing liquid to be treated, shaft means in said tank extending through each of a plurality of axially disposed interconnected generally cylindrical channel-shaped corrugated discs for supporting same, means for securing said discs together in abutting relationship, means for rotating the shaft means to rotate said discs to alternately immerse the discs into the the liquid to be treated and expose bacterial growths disposed thereon to atmosphere, said channel-shaped corrugations being disposed in a parallel chordal relationship and said channel-shaped corrugations extending completely across the discs and having opposite open ends at the periphery of said discs, the adjacent discs being angularly disposed relative to each other to minimize the power required to drive said shaft means.

4,137,173

TRAP FOR GREASE OR OTHER FOREIGN MATTER DISSOLVED OR ENTRAINED IN A LIQUID

Cyril L. Jarvis, 271 Cowie Rd., Durban, Natal, South Africa; Laurence Ayers, Box 449, Bulawayo, and Trevor Hewitt, 36 Cleeve Rd., Montrose, Bulawayo, both of Southern Rhodesia

Filed Dec. 1, 1976, Ser. No. 746,613
Int. Cl.² B01D *35/00, 21/02*
U.S. Cl. 210—187 **12 Claims**



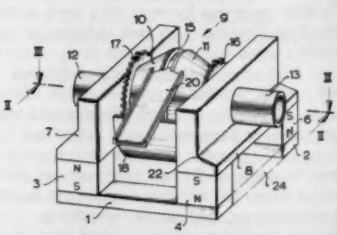
1. A trap for grease or other foreign matter dissolved or entrained in liquids, comprising a chamber disposed about the periphery of said trap, at least one port to admit liquid into the upper portion of said chamber; a central settling tank encompassed by said chamber; said chamber having a bottom wall that inclines downwardly inwardly towards said settling tank for conducting the liquid from said chamber to an inlet to the settling tank, thereby to reduce the turbulence of the liquid as it is conducted from said chamber to said settling tank; said trap being segmental in plan and being comprised of a plurality of mutually separable segments each of which includes a portion of said chamber and a portion of said settling tank, overflow weirs in each segment providing limited fluid communication between adjacent said portions of said chamber, said weirs being of such a height that excess liquid in any chamber portion will overflow said weirs before overflowing out of said trap, and an outlet constructed and arranged for removing decontaminated liquid from said settling tank.

4,137,174

PERMANENT MAGNETIC SEPARATOR FOR LIQUIDS

Heinrich Spodig, 4714 Selm-Bork, Netteberge 202, Fed. Rep. of Germany

Filed Aug. 4, 1977, Ser. No. 821,633
Claims priority, application Fed. Rep. of Germany, Aug. 10, 1976, 2635858
Int. Cl.² B01D *35/06*
U.S. Cl. 210—222 **18 Claims**



1. A permanent magnetic separator for liquids to be purified

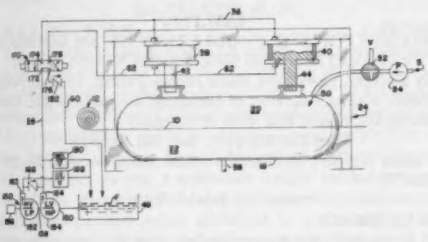
comprising at least one set consisting of two bowl-shaped bodies each of which bowl-shaped bodies is positioned rotatably on a hollow shaft, said bowl-shaped bodies being arranged opposite each other symmetrically and with an operating air gap therebetween, said hollow shafts serving as inflows for the introduction of the liquid to be purified into the interiors of said bowl-shaped bodies, the outflow of said liquid occurring through said operating gap, a container partially surrounding said bowl-shaped bodies and into which said liquid passes after separation therefrom of the ferromagnetic impurities, permanent magnets positioned outside of said bowl-shaped bodies, separate pole shoes each in contact with their associated permanent magnets, said bowl-shaped bodies being oppositely polarized, said pole shoes carrying said hollow shafts, said ferromagnetic impurities being collected from the liquid to be purified in said operating air gap and on and adjacent to the edges of said bowl-shaped bodies, and a stripper associated with said operating air gap to remove said ferromagnetic impurities during rotation of said bowl-shaped bodies for discharge and removal of said ferromagnetic impurities.

4,137,175

METHOD AND MEANS FOR FILTERING LIQUIDS

John A. Bos, Garden City, Mich., assignor to Amsted Industries Incorporated, Chicago, Ill.

Filed Feb. 27, 1978, Ser. No. 881,379
Int. Cl.[2] B01D *35/00*
U.S. Cl. 210—351 **1 Claim**



1. In a filtering system for removing particulate from a filtrate flow wherein said flow enters a filter cavity defined by a fixed lower portion and a movable upper portion and a filter media selectively sealed between said filter portions by an operative device connected to said upper filter portion and having an advance portion and a lift portion, the improvement comprising,

a pumping means divided into a first high-volume/low-pressure portion and a second low-volume/high-pressure portion, said portions having intakes connected to a supply of fluid in a reservoir,

check valve means allowing a flow between an inlet side and an outlet side and preventing an opposite flow, said inlet side connected to a discharge of said first pump portion and said outlet side connected to a discharge of said second pump portion,

an unload device to provide a flow path upon said device sensing a selective first pressure of said fluid, said device having an inlet connected between said inlet side of said first check valve means and said discharge of said first pumping portion, and an outlet connected to said reservoir,

a four-way valving means having a first, second, third and fourth port, said means having a first state providing a flow path between said first and third ports, a second state providing a flow path between said first and second ports and a flow path between said third and fourth ports, and a third state providing a flow path between said first and fourth ports and a flow path between said second and third ports, said first port connected to said outlet side of said check valve means and to said discharge of said second pump portion, said second port connected to said advance portion of said operative device, said third port connected to said reservoir, and said fourth port connected to said lift portion of said operative device, and

pressure relief means to provide a flow path upon said means sensing a selective second pressure having a value substantially greater than said first pressure, said means having an inlet connected between said first port of said valving means, said discharge of said second pump portion and said outlet side of said check valve means, and an outlet connected to said reservoir,

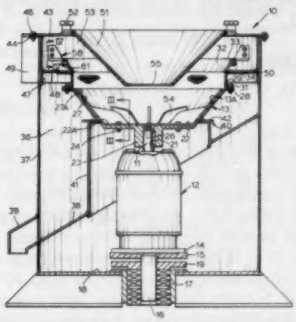
wherein said valving means may be selectively regulated to place filter cavity in a sealed or an unsealed condition or said pumping means in a low energy consuming state.

4,137,176

CHIP DISCHARGE FOR CONTINUOUS CHIP WRINGER

Robert H. Dudley, Portage, and Larry D. Areaux, Texas Township, Kalamazoo County, both of Mich., assignors to Reclamet, Inc., Kalamazoo, Mich.

Filed Oct. 11, 1977, Ser. No. 840,954
Int. Cl.[2] B01D *33/10*
U.S. Cl. 210—375 **7 Claims**



1. A centrifuge for continuously separating a lubricating liquid from lubrication-impregnated metal shavings or the like, comprising:

a motor having a rotatable drive shaft;

inlet means;

substantially bell-shaped centrifugal drum means having a shaving dispensing edge and openings for the discharge of the liquid therethrough;

power transmission means for transmitting rotatable output from said drive shaft to said drum;

collecting chamber means for collecting the liquid emanating from said lubrication-impregnated shavings and for discharging the liquid from said centrifuge;

shaving collecting chamber means including an annular surface surrounding said shaving dispensing edge of said drum radially outwardly spaced therefrom for collecting shavings discharged by centrifugal action from said drum;

an outlet duct means connected to said shaving collecting chamber means and having a central axis extending tangential of said shaving collecting chamber means and away therefrom;

whereby said shaving collecting chamber means will collect said shavings emanating from said dispensing edge and the kinetic energy of said moving shavings will effect a movement thereof along said annular surface and into said outlet duct means for discharge thereof; and

blower blade means secured to said drum and movable therewith for effecting a movement of air into said shaving collecting chamber means through said inlet means and out through said outlet duct means to effect an entrainmemt of said shavings in said air movement for discharge out through said outlet duct means, said blower

blade means including a plurality of blades circumferentially spaced around the periphery of said drum means adjacent said shaving dispensing edge thereof, said shavings moving during said entrainment between said blower blades, each of said blades including support means supporting said blades for movement relative to said drum means.

4,137,177
FILTERING APPARATUS FOR SLUDGY LIQUIDS

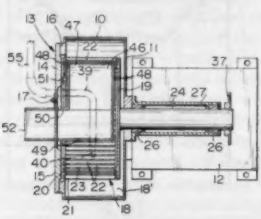
Yoshikazu Shoda, Tokyo, Japan, assignor to Nishihara Environmental Sanitation Research Corporation Limited, Tokyo, Japan, a part interest

Filed Jun. 29, 1976, Ser. No. 700,904

Claims priority, application Japan, Jul. 4, 1975, 50-93495[U]; Jul. 4, 1975, 50-93496[U]; Jul. 4, 1975, 50-93497[U]; Jul. 4, 1975, 50-82467

Int. Cl.² B01D *33/10*

U.S. Cl. 210—403 **1 Claim**



1. A filtering apparatus for sludgy liquid comprising a stationary housing having a front wall and a rear end wall, a filter drum disposed within the housing and having an annular ring defining a front opening adjacent said front wall and a rear end plate and a peripheral filter consisting of a series of closely spaced filter bars extending parallel to the central longitudinal axis of the filter drum between said annular ring and said end plate to define elongated filter openings between the adjacent bars, said filter drum defining an annular space between the housing and the filter drum, means for rotating said filter drum, sludgy liquid supply means extending into the interior of the filter drum for supplying the sludgy liquid onto the inner surface of the filter of the rotating filter drum to separate the sludgy liquid into a solid component and a liquid component and to a deposit the solid component onto said filter, means for discharging filtration residue of the solid component from the interior of the filter drum and means for discharging the liquid component passing through the elongated filter openings through said annular space to the exterior of the housing, said sludgy liquid supply means including a pipe extending horizontally through the front opening of the filter drum towards the inner surface of the filter of the filter drum at an intermediate position between the central longitudinal drum axis and the top of the drum and having opening means for spraying the sludgy liquid onto a downwardly moving portion of the filter to effect the separation of the sludgy liquid into a solid component and a liquid component, said solid component carried by the portion of the filter being separated from it by adhering to aggregations of filtration residue rolling on a bottom portion of the filter drum due to the rotation of the drum, said aggregations of filtration residue which have accumulated on the inner surface of the filter screen being progressively discharged through said discharging means.

4,137,178
PHOSPHORUS-NITROGEN-SILICA COMPOSITION AS A FLAME RETARDANT

Fawzy G. Sherif, Spring Valley, and Mazin R. Irani, Tarrytown, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 8, 1976, Ser. No. 748,430

Int. Cl.² C09K *3/28*

U.S. Cl. 252—8.1 **14 Claims**

1. An insoluble, flame retardant phosphorus-nitrogen-silica composition consisting essentially of:

30–70 weight % P_2O_5

1–15 weight % N

15–50 weight % SiO_2

wherein said composition exhibits x-ray diffraction pattern main identifying peaks as follows:

X-Ray Diffraction Data (Copper K alpha radiation)		
2θ	dA°	I/Io
13.13	6.7371	48
13.60	6.5053	58
16.02	5.5276	100
16.90	5.2417	44
21.80	4.0734	32
24.40	3.6449	38
26.18	3.4010	44

4,137,179
PROCESS FOR THE PRODUCTION OF AN AQUEOUS PREPARATION FOR SHRINK-PROOFING WOOL

Götz Koerner, Essen, and Hans-Jürgen Patzke, Gelsenkirchen-Resse, both of Fed. Rep. of Germany, assignors to TH. Goldsmith AG, Essen, Fed. Rep. of Germany

Filed Jul. 12, 1977, Ser. No. 814,911

Claims priority, application United Kingdom, Jul. 21, 1976, 30404/76

Int. Cl.² D06M *13/10*

U.S. Cl. 252—8.6 **19 Claims**

1. In a process for the production of an aqueous preparation of compounds for shrinkage-proofing wool wherein a dimethylpolysiloxanediol is mixed with emulsifiers and water to form an emulsion, the improvement comprising adding a silane compound selected from the group consisting of aminodialkoxysilanes and aminotrialkoxysilanes wherein the alkoxy portion is methoxy or ethoxy to the emulsion of a dimethylpolysiloxanediol of a viscosity of 1000 to 100,000 cP at 20° C. in such amounts that 1 mole of aminosilane corresponds to every 25 to 1000 dimethylsiloxy units.

4,137,180
FABRIC TREATMENT MATERIALS

Appaya R. Naik, Merseyside, England; Klaus H. Todt, Hamburg, Germany, and Martin A. Wells, Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

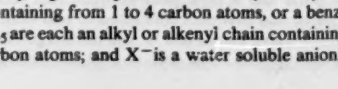
Filed Jul. 1, 1977, Ser. No. 812,423

Claims priority, application United Kingdom, Jul. 2, 1976, 27682/76

Int. Cl.² D06M *13/46*

U.S. Cl. 252—8.8 **21 Claims**

1. A chemical compound which is substantially free of the corresponding monoester having the formula:



wherein R_1, R_2 and R_3 are each an alkyl or hydroxy alkyl group containing from 1 to 4 carbon atoms, or a benzyl group; R_4 and R_5 are each an alkyl or alkenyl chain containing from 11 to 23 carbon atoms; and X^- is a water soluble anion.

4,137,181

STAPLE FIBER, FINISH THEREFOR AND PROCESS FOR USE OF SAME

Roland L. Hawkins, Spartanburg, S.C., assignor to Hoechst Fibers Industries, Spartanburg, S.C.

Division of Ser. No. 715,719, Aug. 19, 1976. This application Jul. 22, 1977, Ser. No. 818,127
Int. Cl.[2] D06M *13/10*
U.S. Cl. 252—8.9 14 Claims

1. A finish composition for promoting dispersion of staple fibers in an aqueous medium comprising as an essential ingredient a primary emulsifier, said emulsifier being ethoxylated and containing at least five moles of ethylene oxide, said emulsifier further being characterized by a surface tension of at least 30 dynes per centimeter in a 0.10 weight percent aqueous solution of same at about 25° C., and said composition being further characterized by a low foaming propensity, and not adversely affecting bondability of the fibers with which it is used in the presence of a chemical bonding agent therefor.

4,137,182

PROCESS FOR FRACTURING WELL FORMATIONS USING AQUEOUS GELS

Herbert S. Golinkin, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 20, 1977, Ser. No. 807,969
Int. Cl.[2] E21B *43/26*
U.S. Cl. 252—8.55 R 19 Claims

1. An aqueous fluid composition comprising water, a soluble polymer selected from the group consisting of the polymeric salts of ammonia, sodium and potassium salts of acrylamide: methacrylate copolymer, said copolymer having a weight ratio of from about 50 to about 90 weight percent acrylamide and from about 10 to about 50 weight percent methacrylate, and said copolymer having a molecular weight sufficient to provide a brine viscosity of at least 1.8 centipoises (measured in Cannon viscometer) when dissolved in a concentration of about 500 ppm in an aqueous brine containing from about 3650 to 3750 ppm sodium chloride and from about 365 to 375 ppm calcium chloride made with deionized water, a chromium ion of a watersoluble trivalent chromium salt in an amount sufficient to cross-link said acrylamide: methacrylate copolymer, said copolymer in an amount sufficient to increase viscosity of said fluid as a gel to a certain initial amount, a carbonate ion in an amount sufficient to actuate rapid formation of said gel upon addition of said chromium salt to said copolymer, an oxalate ion of a water-soluble oxalate salt in an amount sufficient to stabilize said gel against syneresis upon standing and heating.

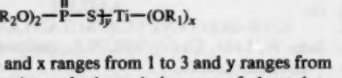
4,137,183

HYDROCARBYL TITANATE DITHIOPHOSPHATE COMPOSITIONS AND PROCESSES

Guntar Caspari, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 21, 1977, Ser. No. 853,130
Int. Cl.[2] C10M *1/48, 3/42, 5/24;* C07F *7/28*
U.S. Cl. 252—32.7 E 13 Claims

1. A compound having the structure



wherein x + y = 4 and x ranges from 1 to 3 and y ranges from 1 to 3 and R_1 comprises a hydrocarbyl group of about 1 to about 18 carbon atoms and R_2 is a hydrocarbyl group of about 1 to 24 carbon atoms.

12. A lubricant comprising a major portion of a lubricant oil and an effective amount of the compound of claim 1.

4,137,184

OVERBASED SULFONATES

Nicolaas Bakker, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 16, 1976, Ser. No. 751,422
Int. Cl.[2] C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33 9 Claims

1. A Group II metal carbonate overbased metal sulfonate of the formula R—SO_3M wherein R is a substantially saturated aliphatichydrocarbyl substituent containing 50 to about 300 aliphatic carbon atoms and M is a Group I or Group II metal or lead.

8. A composition comprising: (A) an oil of lubricating viscosity, and (B) a dispersant amount of an oil-soluble composition of claim 1.

4,137,185

STABILIZED IMIDE GRAFT OF ETHYLENE COPOLYMERIC ADDITIVES FOR LUBRICANTS

John B. Gardiner, Mountainside; James Zielinski, Somerset; Robert L. Elliott, Scotch Plains, and Stanley J. Brois, Westfield, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Jul. 28, 1977, Ser. No. 819,846
Int. Cl.[2] C10M *1/40, 3/34, 1/32, 3/26*
U.S. Cl. 252—33 10 Claims

1. A lubricating oil composition comprising a major amount of a lubricating oil having dissolved therein at least a viscosity index improving amount of an oil-soluble ethylene polymeric viscosity index improver having dispersancy properties and containing in the range of from about 0.001 to 8 wt. % of nitrogen, which improver has been formed by: grafting an ethylene copolymer comprising about 30 to 80 wt. % ethylene and about 20 to 70 wt. % C_3 to C_{28} alpha olefin, with an ethylenically unsaturated acid material selected from the group consisting of unsaturated carboxylic acids and anhydrides of carboxylic acid, reacting said grafted ethylene copolymer with polyamine of 2 to 60 carbons and 2 to 12 nitrogens and having at least two primary amine groups, wherein essentially one of said primary amine groups reacts with an acid moiety of said grafted ethylene copolymer, and reacting with an anhydride of an acid having a C_1 to C_{30} hydrocarbyl group to thereby stabilize the resulting ethylene polymeric viscosity index improver and inhibit viscosity increase of said oil composition upon aging.

4,137,186

PROCESS FOR THE MANUFACTURE OF OVERBASED MAGNESIUM SULFONATES

Albert R. Sabol, Munster, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 22, 1977, Ser. No. 854,037
Int. Cl.[2] C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33 10 Claims

1. A process for the manufacture of overbased magnesium sulfonate comprising forming a composition comprising an oil soluble sulfonic acid compound containing from about 1 to 100 weight percent oil soluble ammonium sulfonate, a stoichiometric excess based on the sulfonic acid compound of a hydratable magnesium compound, water, a lower alkanol and at least one substantially inert diluent, heating the composition to hydrate the magnesium compound, after the hydration is complete, heating the mixture to remove substantially all the lower alkanol, and then adding an acidic material to the mixture at a temperature between about 80° F. to 155° F. to form an amorphous magnesium suspension.

4,137,187
ANTIWEAR ADDITIVE AND LUBRICATING OIL COMPOSITION CONTAINING SAME

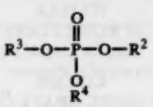
Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 10, 1977, Ser. No. 823,313
Int. Cl.[2] C10M *1/48*
U.S. Cl. 252—46.6 11 Claims

1. An anti-wear additive for lubricating compositions comprising

(A) 1 part by weight of a sulfurized acid prepared by sulfurizing an acid of the formula R-COOH wherein R is C_{10}–C_{40} alkenyl, said sulfurized acid having a minimum sulfur content of 3% by weight and

(B) 1–100 parts by weight of a phosphate of the formula



wherein each of R^2, R^3, and R^4 is independently a C_6–C_{20} aromatic or C_1–C_{20} aliphatic hydrocarbon group.

4,137,188
MAGNETIC TONER FOR ELECTROPHOTOGRAPHY

Shigeru Uetake; Katsutoshi Tozawa, and Keiji Sato, all of No. 1, Sakura-machi, Hino City, Tokyo, Japan

Continuation of Ser. No. 739,130, Nov. 5, 1976, abandoned. This application Feb. 1, 1978, Ser. No. 874,151
Claims priority, application Japan, Nov. 7, 1975, 50/134570
Int. Cl.[2] G03G *9/14*
U.S. Cl. 252—62.1 P 6 Claims

1. A process of making an insulating magnetic toner, useful as a one component developer for electrophotography comprising the steps of mixing ferromagnetic particles, a thermoplastic resin and a charge controlling agent, heat kneading, cooling and granulating the resulting mixture into fine particles, contacting the fine particles with a hot gas of a temperature higher than the toner softening point and lower than 500° C. for a length of time sufficient so that particles smaller than about 1 μm in size fuse to larger particles thereby reducing the content in percent by weight of the toner particles smaller than about 1 μm in size to a range between 0.10 and 0.00, cooling the particles and then selecting the particles having an average particle size in the range of about 7 to about 30 μm.

4,137,189
THREE COMPONENT COMMON HYDRAULIC FLUID COMPRISING A NON-LINEAR SILOXANE FLUID

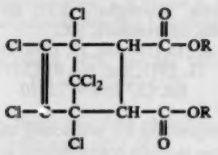
George W. Holbrook, Midland; Eugene R. Jakubczak, Bay City, and Charles A. Roth, Midland, all of Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Jan. 19, 1977, Ser. No. 760,776
Int. Cl.[2] C10M *3/44*
U.S. Cl. 252—75 26 Claims

17. In a process of transmitting power from one place to another via a hydraulic fluid medium, the improvement which comprises using as the hydraulic fluid medium a composition consisting essentially of

(A) 89.5 to 94.75 percent by weight of a siloxane fluid having a viscosity of less than 10,000 centistokes at 25° C., said siloxane fluid being composed of $R'SiO_{3/2}$ units wherein R' is selected from the group consisting of methyl, ethyl, propyl, butyl, octyl, 3-chloropropyl and 3,3,3-trifluoropropyl radicals, R''_2SiO units and $R''_3SiO_{1/2}$ units wherein at least 95 percent of the R'' radicals are methyl radicals, there being from 1 to 10 mole percent of the $R'SiO_{3/2}$ units in the siloxane fluid, and the mole ratio of the $R'SiO_{3/2}$ units to the $R''_3SiO_{1/2}$ units in the siloxane fluid being less than 1.2,

(B) 5 to 10 percent by weight of a chlorendate having the general formula



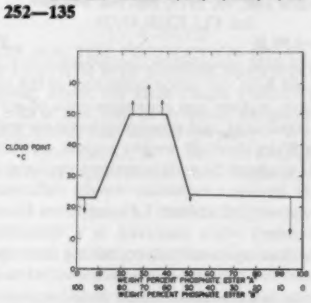
wherein each R is an alkyl radical containing from 4 to 10 carbon atoms or the tetrahydrofurfural radical, and

(C) 0.25 to 0.5 percent by weight of a compound selected from the group consisting of antimony dithiocarbamates, antimony phosphorodithioates, lead dithiocarbamates and lead phosphorodithioates.

4,137,190
DETERGENT COMPOSITION COMPRISING SYNERGISTIC HYDROTROPE MIXTURE OF TWO CLASSES OF ORGANIC PHOSPHATE ESTERS

Paritosh M. Chakrabarti, Wayne, N.J., and Richard A. Grillo, Bangor, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 4, 1977, Ser. No. 784,541
Int. Cl.[2] C11D *3/36, 1/825, 1/66*
U.S. Cl. 252—135 8 Claims



1. A detergent composition consisting essentially of

I. a low-foaming, non-ionic surfactant and,

II. a synergistic hydrotrope mixture of;

A. a first phosphate ester which is the reaction product of:

(1) phosphorus pentoxide with

(2) a compound of Formula I:

$$R + OCH_2 - CH_2 +_n OH \quad (I)$$

wherein R is alkyl, aryl, aralkyl or alkaryl and wherein n is 1 to 10,

and the molar ratio of (1) to (2) is 1:2 to 1:4.5 and

B. a second phosphate ester which is the reaction product of:

(1) 105–130% polyphosphoric acid with

(2) a compound of Formula I and the molar ratio of (1) to (2) is 1:0.3 to 1:1.5 and wherein the weight ratio of A:B is 1:9 to 9:1, and

III. a builder selected from the group consisting of alkali metal hydroxides, carbonates, bicarbonates, phosphates, silicates, sulfates, and chlorides.

4,137,191
LOW-IRRITANT SURFACTANT COMPOSITION

John W. Lohr, Cherry Hill, N.J., assignor to Inolex Corporation, Chicago, Ill.

Filed Feb. 14, 1977, Ser. No. 768,203
Int. Cl.[2] A61K *7/08;* C11D *1/90, 1/94, 3/43*
U.S. Cl. 252—153 11 Claims

1. A method for preparing a low irritant surfactant composition which comprises preparing a betaine surfactant compound

having at least one long chain aliphatic radical attached to a positively charged nitrogen atom by reacting, in a non-aqueous liquid medium, a chloroacetic acid salt with a tertiary amine having at least one long chain aliphatic radical attached to the amino nitrogen atom, said non-aqueous liquid medium comprising a water-miscible, polar, organic liquid having a boiling point of at least 180° C., and adding to said betaine product, while still dispersed in said non-aqueous medium, a substantially equimolar amount of an amine fatty alcohol sulfate in which the fatty alcohol moiety contains from 8 to 18 carbon atoms, the amount of said non-aqueous liquid medium being selected so that said betaine and said amine fatty alcohol sulfate together comprise at least 40 percent by weight of said composition.

4,137,192

LIQUID CRYSTALLINE COMPOSITION

Yoji Matsufuji, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1975, Ser. No. 543,431

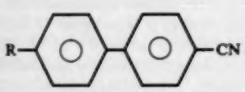
Claims priority, application Japan, Jan. 25, 1974, 49-10732; Jan. 31, 1974, 49-13020; Jan. 31, 1974, 49-13021; May 30, 1974, 49-61346

Int. Cl.[2] G02F *1/13*; C09K *3/34*

U.S. Cl. 252—299 **67 Claims**

1. A liquid crystalline composition which comprises:

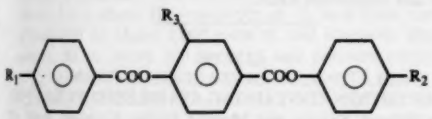
(a) at least one biphenyl liquid crystal material represented by the formula (1) and having a positive dielectric anisotropy:



(1)

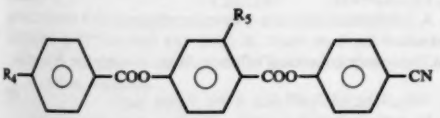
wherein R represents an alkyl or an alkoxy group; and

(b) at least one other liquid crystal material selected from those liquid crystal materials represented by the formulae (2) to (6):



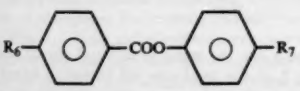
(2)

wherein R_1 and R_2 each represents an alkyl, alkoxy, acyloxy or alkoxycarbonyloxy group, and wherein R_3 represents a hydrogen atom or a methyl group;



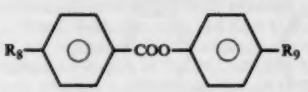
(3)

wherein R_4 represents an alkyl or alkoxy group, and wherein R_5 represents a hydrogen atom or a methyl group;



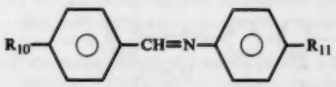
(4)

wherein R_6 represents a cyano group and R_7 represents an alkyl group having a carbon content of from 3 to 10 or an alkoxy group having a carbon content of from 1 to 9;



(5)

wherein one of R_8 and R_9 represents an acyloxy or alkoxycarbonyloxy group and the other of R_8 and R_9 represents an alkyl group or an alkoxy group, and wherein the sum of the carbon content, not including carbonyl carbons, in both R_8 and R_9 is not less than 4; and



(6)

wherein either one of R_{10} and R_{11} represents a cyano group and the other of R_{10} and R_{11} represents an alkyl, alkoxy or acyloxy group.

4,137,193

UTILIZATION OF DYES FOR LIQUID CRYSTAL DISPLAYS

Maged A. Osman, Zürich, and Terry J. Scheffer, Forch, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

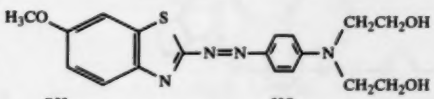
Filed Jun. 23, 1977, Ser. No. 809,276

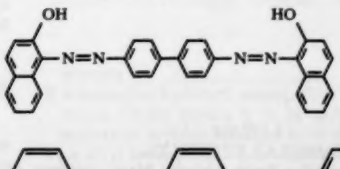
Claims priority, application Switzerland, Jun. 23, 1976, 7996/76

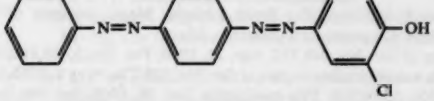
Int. Cl.[2] G02F *1/13*; C09K *3/34*

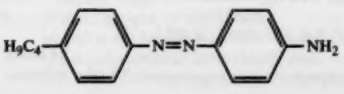
U.S. Cl. 252—299 **13 Claims**

1. In a cholesteric guest-host liquid crystal composition having a positive dielectric anisotropy and consisting of a nematic host component composed of a mixture of N-p-butoxy-, N-p-hexyloxy-, and N-p-octanoyloxybenzylideneaminobenzonitrile with a dye incorporated as a guest component therein and an optically active (cholesteric) component, the improvement consisting of at least one water insoluble azo dye guest component which is stable under conditions of continuous operation at an applied ac voltage of 20 volts and a temperature of 100° C., and which has a pleochroic ratio a_1/a_2 of greater than 6.5 and an absorption maximum in the range of from 350 to 700 nm, wherein said azo dye is a compound selected from the group consisting of









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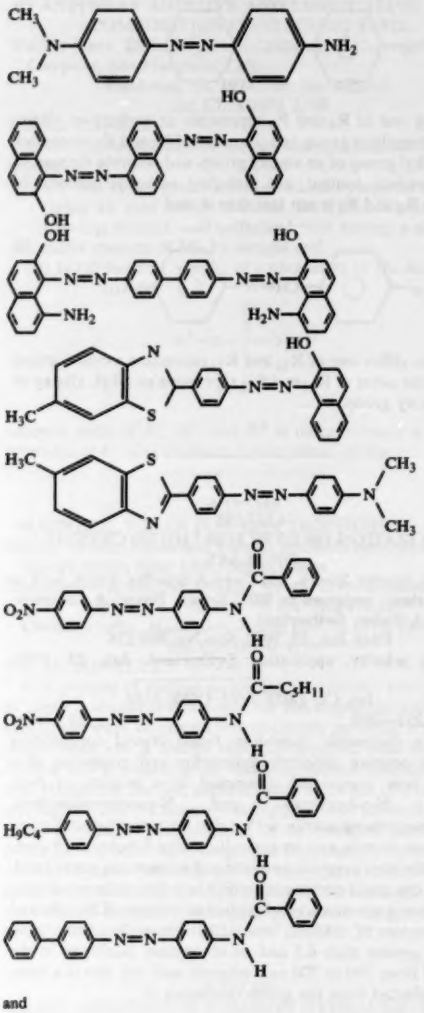
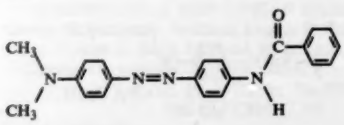


and



4,137,194

CAPSULAR PRODUCTS

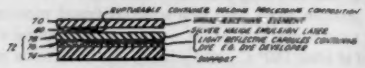
William J. McCune, Jr., South Lincoln, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 545,333, Apr. 26, 1966, Pat. No. 3,468,662, which is a continuation-in-part of Ser. No. 108,774, May 9, 1961, Pat. No. 3,276,869. This application Jun. 25, 1969, Ser. No. 836,333

Int. Cl.[2] B01J *13/02*

U.S. Cl. 252—316 **3 Claims**

1. Microscopic capsules consisting essentially of a substantially continuous film-forming polymeric layer surrounding a nucleus comprising a color-providing substance, said polymeric layer having a substantially continuous metallic layer thereover.



4,137,195

CATALYST FOR DISPROPORTIONATION OF TOLUENE

Chin-Chiun Chu, South Plainfield, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 734,701, Oct. 21, 1976, Pat. No. 4,098,837, which is a continuation-in-part of Ser. No. 680,998, Apr. 28, 1976, Pat. No. 4,011,276. This application Jul. 29, 1977, Ser. No. 820,192

Int. Cl.[2] B01J *27/14, 29/06*

U.S. Cl. 252—437 **9 Claims**

1. A catalyst comprising a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12, said catalyst having been modified by initial treatment with an ammonium phosphate followed by treatment with a magnesium compound to yield a composite containing phosphorus oxide and magnesium oxide, each in an amount of at least about 0.25 percent by weight.

4. A method for preparing a catalyst composition which comprises contacting a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12 with a solution of an ammonium phosphate, followed by maintaining the phosphorus-containing zeolite at a temperature between about 20° and about 100° C. to yield a product containing phosphorus oxide, contacting the resulting zeolite containing phosphorus oxide with a solution of a magnesium compound, followed by maintaining the zeolite at a temperature between about 20° and about 100° C. to yield a final product containing phosphorus oxide and magnesium oxide.

4,137,196

GELATINOUS FRAGRANCE-IMPARTING COMPOSITION CONTAINING STABILIZED PERFUME

Akira Sakurai, Sakura, and Mansbu Fujita, Kashiwa, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1978, Ser. No. 898,129

Claims priority, application Japan, May 23, 1977, 52-59572

Int. Cl.[2] C11B *9/00*

U.S. Cl. 252—522 **7 Claims**

1. A gelatinous fragrance-imparting composition comprising a gel substrate, a perfume, at least one first additive selected from the group consisting of phosphates having the formula:

$$(M)_m(H)_{3-m}PO_4 \cdot xH_2O \quad (I)$$

wherein M is sodium, potassium or ammonium, m is an integer of from 1 to 3, and x is 0 or an integer of from 1 to 12, and carbonates having the formula:

$$(M)_n(H)_{2-n}CO_3 \cdot xH_2O \quad (II)$$

wherein M and x are the same as defined above and n is an integer of 1 or 2, and at least one pH adjusting agent selected from said phosphates and carbonates, with the proviso that said pH adjusting agent is different from said first additive, and wherein the pH of said composition is in the range of from 6.0 to 10.0.

4,137,197

POWDERED DETERGENT COMPOSITIONS CONTAINING A CALCIUM SALT OF AN ANIONIC SURFACTANT

John Kowalchuk, Palisades Park, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 10, 1977, Ser. No. 850,321
Int. Cl.[2] C11D 1/83, 1/12, 3/065
U.S. Cl. 252—532 25 Claims

1. A mechanically mixed, non-spray dried, powdered laundry detergent composition comprising:

(a) from about 4 to about 20 weight percent of the calcium salt of a non-soap, organic, anionic surfactant;

(b) from about 4 to about 20 weight percent of an ethoxylated alcohol nonionic surfactant; and

(c) from about 5 to about 70 weight percent of an alkali metal salt of a phosphate sequestering builder compound;

the percentages being based on the total weight of the composition.

4,137,198

POLYMER-INORGANIC FOAM

Carrol C. Sachs, 14721 Lull St., Van Nuys, Calif. 91405

Continuation-in-part of Ser. No. 84,943, Oct. 28, 1970, Pat. No. 3,775,351. This application Nov. 2, 1973, Ser. No. 412,333
Int. Cl.[2] C08J 9/30
U.S. Cl. 521—154 19 Claims

1. A polymer-inorganic cellular hybrid foam of low density, and which is load supporting, fire resistant, thermally insulating and has low thermal expansion, consisting essentially of a plastic phase matrix formed of unexpanded polymer particles selected from the group consisting of polyvinyl acetate, butadiene-styrene and silicone resins, and an inorganic phase formed of particles selected from the group consisting of Portland cement and gypsum, substantially uniformly distributed through said plastic phase, said inorganic phase being substantially free of sand, rock or aggregate, intersticial compounds or complexes being formed between said inorganic phase and said plastic phase, said hybrid foam having a density ranging from about 10 to about 80 pounds per cu. ft., said foam containing about 300 to about 1,000 parts of said inorganic phase and about 50 to about 100 parts of said polymer particles, by weight, said foam being substantially free of surface active agents.

4,137,199

FIRE-RETARDANT COMPOSITION

Geoffrey T. Brown, and John R. Case, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jul. 7, 1975, Ser. No. 593,241
Claims priority, application United Kingdom, Jul. 16, 1974, 31424/74; Jul. 16, 1974, 31423/74
Int. Cl.[2] C08J 9/00
U.S. Cl. 521—138 20 Claims

1. A composite material comprising a mixture of an organic polymer, a phosphate fire retardant, and

(i) a blowing agent and a hydroxy group-containing organic acid or salt thereof, said blowing agent being characterised as a compound which decomposes with evolution of a non-flammable gas when heated to a temperature in the range 150° C. to 400° C., or

(ii) a reaction product of a blowing agent and said acid or salt thereof.

4,137,200

CROSSLINKED HYDROPHILIC FOAMS AND METHOD

Louis L. Wood, Rockville, Md., and Kurt C. Frisch, Grosse Ile, Mich., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 404,823, Oct. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 250,012, May 3, 1972, abandoned. This application Jun. 10, 1977, Ser. No. 805,458
Int. Cl.[2] C08J 9/02
U.S. Cl. 521—159 10 Claims

1. A crosslinked hydrophilic foam having a three-dimensional network comprising the reaction product of

A. isocyanate capped prepolymers consisting of a mixture of

(1) an isocyanate capped hydrophilic polyoxyethylene diol, said diol having an ethylene oxide content of at least 40 mole percent; and

(2) an isocyanate capped polyol having a hydroxyl functionality in the range 3 to 8 prior to capping; said isocyanate capped polyol being present in an amount in the range 2.9 to 50% by weight of (1) and (2);

B. 3.2 to 7.9% by weight of A and B of a polyisocyanate having an isocyanate functionality in the range 2.0 to 2.8; and

C. 6.5 to 390 moles of water for each mole of unreacted isocyanate.

4,137,201

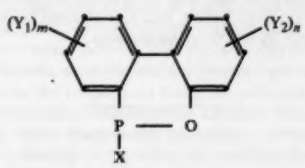
CYCLIC PHOSPHONITE STABILIZED CELLULOSE ESTER COMPOSITIONS

Chung-Ming Kuo; Richard H. S. Wang, and Richard T. Bogan, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

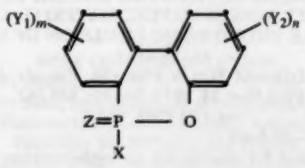
Filed Sep. 2, 1977, Ser. No. 830,296
Int. Cl.[2] C08L 1/10, 1/12, 1/14
U.S. Cl. 260—13 8 Claims

1. A cellulose ester plastic composition containing a thermally stabilizing amount of the combination of

(A) about 0.10 to 1 part by weight of at least one cyclic phosphonite compound having the formula



or



wherein

X is hydrogen, hydroxyl, amino, alkyl having 1 to 22 carbon atoms, alkoxy having 1 to 22 carbon atoms, alkylthio, aryloxy or arylthio having 1 to 22 carbon atoms;

Y_1 is alkyl having 1 to 18 carbon atoms;

Y_2 is halogen, alkyl having 1 to 18 carbon atoms, alkoxy having 1 to 18 carbon atoms, nitro, cyano or sulfonic acid radical;

Y_1 and Y_2 combined with a biphenyl ring form a phenanthrene ring;

Z is an oxygen or sulfur atom;

m and n are whole numbers ranging from 0 to 4;

(B) a conventional antioxidant; and

(C) an acid accepting epoxy compound.

4,137,202

METHOD OF SYNTHESIZING POLYVINYL CHLORIDE COMPOSITIONS

Herbert Heinen, Neunkirchen, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Bezirk Cologne, Germany

Filed Dec. 27, 1974, Ser. No. 537,017

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1974, 2400611

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—23 XA 14 Claims

1. In a process of preparing vinyl chloride polymer by the polymerization of monomeric material consisting essentially of vinyl chloride, in an aqueous medium containing a suspension vehicle, catalyst for the polymerization, and at least one additive, the improvement, for obtaining free-flowing chloride polymer, ready for fabrication, which comprises dissolving ethylene-vinyl ester copolymer in the vinyl chloride before beginning the polymerization.

4,137,203

ZINC NEUTRALIZED SULFONATED ELASTOMERIC POLYMER

Henry S. Makowski, Scotch Plains; Douglas Brenner, Livingston, both of N.J., and Jan Bock, Houston, Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,553

Int. Cl.[2] C08L *91/00;* C08K *5/01*

U.S. Cl. 260—23.5 A 11 Claims

1. An elastomeric composition including:

(a) a neutralized sulfonated EPDM elastomeric terpolymer having about 15 to about 50 meq. zinc sulfonate groups per 100 grams of said sulfonated EPDM elastomeric terpolymers; and

(b) about 8 to about 60 parts by weight of zinc stearate based on 100 parts of said zinc neutralized sulfonated EPDM elastomeric terpolymers, said zinc stearate containing less than about 30 wt. % of stearic acid.

4,137,204

CATIONIC METHOD FOR EMULSIFYING ASPHALT-RUBBER PAVING MATERIAL AND A STABLE THIXOTROPIC EMULSION OF SAID MATERIAL

Charles H. McDonald, 3130 W. Pierce St., Phoenix, Ariz. 85009

Filed Nov. 14, 1977, Ser. No. 851,062

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—28.5 AS 6 Claims

1. A method for emulsifying an asphalt-rubber pavement material into a stable, thixotropic emulsion capable of flowing as a liquid upon agitation and comprising the steps of:

a. heating a mixture of about 2 to about 5 parts of paving grade asphalt with a penetration range of 10 through 300 and about 1 part of particulate non-oil resistant asphalt soluble rubber, reclaimed rubber and partially devulcanized reclaimed rubber to a temperature within the range of about 350° F. to about 500° F. to form a jellied reaction product, and

b. admixing said jellied reaction product with an asphalt-rubber soap consisting essentially of water, a cationic water soluble emulsifying agent comprising a mixture of imidazoline and quaternary diamine asphalt emulsifiers, a thickener, and aluminum sulfate.

4,137,205

AQUEOUS EMULSION THERMOSETTING COATING COMPOSITIONS

Donald J. Berenschot, Chicago; Dale F. Anders, Des Plaines, and Fred D. Hawker, Villa Park, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Aug. 15, 1974, Ser. No. 497,342

Int. Cl.[2] C08L *29/00, 33/14, 61/28*

U.S. Cl. 260—29.4 UA 18 Claims

1. An aqueous emulsion thermosetting coating composition comprising water having emulsified therein:

(1) an aqueous emulsion mercaptan-terminated copolymer of ethylenically unsaturated materials produced by emulsion copolymerization in the presence of surface active agents of monomers consisting essentially, based on the weight of the copolymer, of:

A. from 0.75–25% of non-nitrogenous hydroxy functional monoethylenically unsaturated monomer;

B. from about 0.1% to about 15% of monoethylenically unsaturated carboxylic acid; and

C. the balance of said copolymer consisting essentially of monoethylenically unsaturated monomer free of functional groups other than said monoethylenic unsaturation;

(2) from about 3% to about 40%, based on the total weight of resin solids, of an aminoplast resin; and

(3) from about 5 to about 50 parts per 100 parts of copolymer of water dispersible high boiling polyhydric adduct of an aliphatic polyhydric alcohol having from 2–4 hydroxy groups with a C_2–C_4 monoepoxide or a lactone containing 3–6 carbon atoms, said adduct having a molecular weight of from about 300 to about 6000.

4,137,206

TIRE PROTECTION COMPOSITION

Jerry B. Kent, Arlington, Tex., assignor to New World Products, Inc. and Tri-Texas, Inc., both of Arlington, Tex., part interest to each

Filed Feb. 14, 1977, Ser. No. 768,024

Int. Cl.[2] C08L *29/04*

U.S. Cl. 260—29.6 B 6 Claims

1. An aqueous liquid tire sealing and balancing composition capable of imparting corrosion resistance to metallic wire belts of belted elastomeric tires comprising:

(a) an aqueous solution of polyvinyl alcohol, the ratio of polyvinyl alcohol to water being from about 0.5:100 to about 1:100;

(b) a fibrous component of asbestos and fiberglass fibers, said fibrous component being present in an amount of from about 4% to about 10% by weight of said liquid tire sealing and balancing composition; and,

(c) an organic volatile amine or amine salt capable of volatilizing within said tire, migrating to said elastomer, permeating the said elastomer and reaching the metallic wire belts thereof, said organic volatile amine or amine salt being selected from the group consisting of isopropylamine, dibutylamine, diisopropylamine, cyclohexylamine, dicyclohexylamine, isopropylhexylamine, ethylmorpholine, naphthylamine, the benzoate, carbonate or nitrite salts thereof and mixtures thereof, said amine or amine salt being present in an amount of from about 0.01% to about 0.5% by weight of said liquid tire sealing and balancing composition, said liquid tire sealing and balancing composition having a viscosity of from about 1000 to about 2200 cps. at 100° F.

5. A method of imparting corrosion resistance to the metallic tire reinforcement elements within the elastomeric carcass of a tire which comprises introducing within said tire an aqueous tire balancing and/or sealing composition containing an organic volatile amine or amine salt capable of volatilizing within said tire, migrating to said elastomer, permeating said elastomer and reaching the metallic tire reinforcement elements, said organic volatile amine or amine salt being selected from the

group consisting of isopropylamine, dibutylamine, diisopropylamine, cyclohexylamine, dicyclohexylamine, isopropylhexylamine, ethylmorpholine, naphthylamine, the benzoate, carbonate or nitrite salts thereof and mixtures thereof.

4,137,207
PROCESS FOR THE PRODUCTION OF RESINS CONTAINING HYDROXYL GROUPS

Gundolf Fuchs, Buchholz, and Dietrich Pirck, Reinbek, both of Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 412,235, Nov. 2, 1973, abandoned. This application Oct. 24, 1975, Ser. No. 625,391

Int. Cl.² C08K 5/01; C08L 25/04, 61/28, 67/00

U.S. Cl. 260—29.6 T **8 Claims**

1. A synthetic resin containing hydroxyl groups suitable for use in preparing baking varnishes which comprises a copolymer of a vinyl aromatic hydrocarbon of from 8 to 12 carbon atoms, an ester of an alpha, beta-unsaturated monocarboxylic acid and an alpha, beta-unsaturated dicarboxylic acid in solution or dispersion, the said copolymer having been prepared in the presence of an ester of an alpha, beta-unsaturated dicarboxylic acid with an aliphatic alcohol of from 10 to 20 carbon atoms as a dispersing agent, the carboxyl groups of the said copolymer being esterified with an alcohol having from 1 to 8 carbon atoms or a glycol monoether of the formula:

$$ROCH_2CH_2OH,$$

wherein R is straight or branched chain alkyl of from 1 to 6 carbon atoms, to yield a half-ester copolymer and then reacted with an alkylene oxide having from 2 to 4 carbon atoms until the residual acid number of the said hydroxyl copolymer is reduced to a value of from about 0 to 2 mg KOH/g of the copolymer, based on a 50 weight percent solution or suspension and finally adjusting the acid number of the said solution or said dispersion to at least 5 by adding phosphoric acid thereto, the mole ratio of the vinyl aromatic hydrocarbon to the ester of the alpha, beta-unsaturated monocarboxylic acid to the alpha, beta-unsaturated dicarboxylic acid or anhydride thereof being between 30:20:50 and 40:10:50; wherein the said half-ester copolymer is reacted with the said alkylene oxide at a temperature between about 60 and about 100° C. utilizing a mole ratio of alkylene oxide to the half-ester copolymer of between about 0.1:1 to 1.1.

8. A baking varnish consisting essentially of a solution of the synthetic resin containing hydroxyl groups of claim 1 in a solvent selected from the group consisting of an aromatic hydrocarbon solvent boiling in the range of about 150 to 190° C., and a mixture of about 10 to about 15 percent by weight of kerosene boiling in the range of about 150 to about 190° C., and with the balance being an aromatic hydrocarbon solvent boiling in the same range; blended with melamine resin, and wherein the weight percent ratio of the said synthetic resin to the melamine resin is from about 90:10 to about 70:30.

4,137,208
COATING COMPOSITION

William T. Elliott, Concord West, Australia, assignor to Berger, Jenson & Nicholson Limited, London, England

Filed May 4, 1977, Ser. No. 793,857

Claims priority, application Australia, May 6, 1976, PC5834

Int. Cl.² C08L 31.02

U.S. Cl. 260—29.6 RB **10 Claims**

1. A coating composition comprising:

(a) an aqueous latex of film-forming resin binder

(b) finely dispersed therein, from 0.05 to 3 parts, per part by weight of the film-forming resin binder, of a non-solvent for the film-forming binder of sufficiently low volatility to produce, on first removing water from the latex and secondly removing said non-solvent, a continuous non-porous microcellular film having minute discrete closed voids, and

(c) non-film-forming granules of a weight average particle size in the range of 5 to 60 microns of a polymer which is not dissolved by water or by the non-solvent, present in an amount of from 5 to 75% by volume of the non-volatile content of the composition.

4,137,209
GLASS FIBER SIZE COMPOSITION

Robert Wong, and Martin C. Flautt, both of Granville, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 14, 1977, Ser. No. 850,889

Int. Cl.² C08L 31/04

U.S. Cl. 260—29.6 NR **8 Claims**

1. An aqueous size composition for use in the treatment of glass fibers comprising (1) a heat-curable polyurethane latex (2) a film-forming polymer (3) a thixotropic gelling agent and, (4) at least one organo silane coupling agent.

4,137,210
METHOD OF COLD-SHAPING OF MIXTURES COMPRISING POLY[2.2.1]BICYCLO-2-HEPTENE OR ITS SHORT-CHAIN

Claude Stein, Verneuil-en Halatte, and Patrick le Delliou, Issy-les-Moulineaux, both of France, assignors to Societe Chimique des Charbonnages, Courbevoie, France

Continuation-in-part of Ser. No. 659,684, Feb. 20, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,836

Claims priority, application France, Feb. 27, 1975, 75 06213

Int. Cl.² C08K 5/12

U.S. Cl. 260—31.2 R **13 Claims**

1. A method of cold-shaping of mixtures comprising poly (2.2.1) bicyclo 2-heptene said method comprising the steps of : bringing a powder of finely divided ring opened poly (2.2.1) bicyclo 2-heptene having an apparent density of 0.2 to 0.5 and obtained by polymerizing (2.2.1) bicyclo 2-heptene in the presence of a catalyst system selected from the group consisting of a noble metal compound with a reducing substance and a tungsten compound with a compound having at least one metal hydrocarbon link, into contact at room temperature with at least one compound of low volatility from the group consisting of the organic esters derived from aliphatic and cyclanic alcohols, the aliphatic, aromatic and naphthenic hydrocarbons and their mixtures, the proportions being 100–450 parts by weight of said low volatility compounds per 100 parts of said polymer; effecting at room temperature an intimate mixture of these constituents; shaping or moulding the resulting fluent mixture before its jellification and leaving the shaped mixture to jellify at room temperature.

4,137,211
WIRE COATING SOLUTION

Raymond W. Angelo; Edward J. Armstrong, both of Endwell, and Robert Bock, Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 24, 1977, Ser. No. 800,106

Int. Cl.² C08K 5/01; C08L 63/02, 63/00

U.S. Cl. 260—31.4 EP **9 Claims**

1. A solderable, flame retardant wire coating solution consisting of about 30–40% by weight of solids in about 70–60% by weight of solvent wherein said solids comprise by weight:

from 31 to 35% of a polyol containing bromine and phosphorous;

from 9 to 12% of a hydroxy terminated saturated polyester of adipic acid and ethylene glycol;

from 14 to 21% of a solid epoxy condensation product of bisphenol A and epichlorohydrin wherein said condensation product has an epoxy equivalent of 1650–2050;

from 35 to 43% of phenol blocked toluene diisocyanate adduct; and

a catalyst between 0.1 and 1.0% of the solids.

4,137,212

FLAMEPROOFED NYLON MOLDING COMPOSITIONS

Rainer Theysohn, Ludwigshafen; Klaus Penzien; Wolfgang Seydl, both of Frankenthal; Rolf Wurmb, Heidelberg; Horst Reimann, Worms; Claus Cordes, Weisenheim, and Hans-Josef Sterzel, Dannstadt-Schauernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 30, 1977, Ser. No. 855,890

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1977, 2703419

Int. Cl.[2] C08K 5/03, 3/10

U.S. Cl. 260—37 N 12 Claims

1. A synthetic linear polyamide molding composition which can be processed by thermoplastic methods and which contains a halogen-containing flameproofing agent and a synergistic metal oxide, with or without a filler, wherein the flameproofing agent comprises from 5 to 30% by weight, based on the total molding composition, of brominated styrene oligomers, said oligomers containing from 40 to 80% by weight of bromine, having a mean degree of polymerization of from 3 to 90, and having been manufactured by nuclear bromination of styrene oligomers.

4,137,213

PIGMENT FORMULATIONS FOR USE IN SURFACE-COATING BINDERS

Fritz E. Kempter, Mannheim; Erich Gulbins, Heidelberg-Neuenheim; Armin Haag, Gross-Sachsen, and Ruprecht Kroker, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 31, 1977, Ser. No. 764,196

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1976, 2606831

Int. Cl.[2] C08K 9/04

U.S. Cl. 260—39 P 7 Claims

1. A pigment formulation which contains pigments, organic solvents and from 10 to 80% by weight of a wetting agent, wherein the wetting agent is a non-ionic organic compound which has a viscosity of from 500 to 10,000 mPa.s and has been produced by reacting

(A) an alkylated amide/formaldehyde condensation product with

(B) a modified epoxy resin which is an adduct of an epoxy resin and one or more compounds selected from the group consisting of phenol, bisphenol, mercaptan and dimercaptan, at least 80% of the epoxide groups of the epoxy resin having undergone adduct formation, the weight ratio of (A) to (B) being from 9:1 to 1:9 and the reaction of (A) with (B) being carried out at from 80 to 120° C. in the presence of an acid catalyst.

4,137,214

ASBESTOS FREE FRICTION COMPOSITIONS

Henry A. Sochalski, Trenton, N.J., assignor to Thiokol Corporation, Newton, Pa.

Continuation-in-part of Ser. No. 813,609, Jul. 7, 1977, abandoned. This application Nov. 9, 1977, Ser. No. 849,722

Int. Cl.[2] C08K 3/22, 3/26, 7/06, 7/14

U.S. Cl. 260—38 18 Claims

1. A friction material, substantially free of asbestos, which comprises:

(a) a thermosetting resin;

(b) cashew nut particles;

(c) from 5% to 15% of a non-asbestos fiber; and

(d) more than 20% by weight of a powdered inorganic compound having a Moh's hardness rating of greater than 2.0 and less than 5.0 and capable of being subjected to temperatures of greater than about 425° C. without substantial chemical or physical alteration.

4,137,215

PROCESS FOR PREPARING DECORATIVE PLASTICS ARTICLES, AS WELL AS PRODUCTS PREPARED ACCORDING TO THE PROCESS

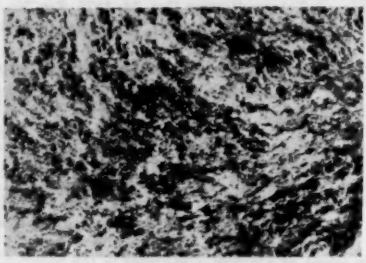
René L. E. Van Gasse, Schoten, Belgium, assignor to Stamicarbon, B.V., Geleen, Netherlands

Continuation of Ser. No. 463,368, Apr. 23, 1974, abandoned. This application Jan. 5, 1976, Ser. No. 646,488

Claims priority, application Netherlands, Apr. 26, 1973, 7305807

Int. Cl.[2] C08L 67/00

U.S. Cl. 260—40 R 9 Claims



1. A process for imparting a reproduceable decorative effect in a molded plastic article, said decorative effect extending throughout said article, which process comprises the steps of:

(A) forming a molding composition by mixing

(i) a curable thermosetting binder material, composed of an unsaturated polyester admixed with styrene monomer,

(ii) at least one inorganic filler selected from calcium carbonate, calcium magnesium, and crystalline minerals,

(iii) glass fiber, and

(iv) solid polymer particles in an amount of from 0.1 to 20% by weight, based on said binder, said particles being a homopolymer or copolymer of styrene or of polyvinyl acetate and having dimensions between 0.1 and 10 millimeters, a visible color different from the color of said binder, and being composed of a homopolymer or copolymer, which is at least partially soluble in said binder material at elevated temperatures and pressures and

(B) placing said composition in a mold and subjecting the same to elevated temperatures pressures for a period of time predetermined to be sufficient to

(a) cure said thermosetting binder material, but

(b) insufficient to effect more than partial solubilization of polymer particles in said binder material,

whereby a decorative molded article is obtained in which said solid polymer particles are partially solubilized and dispersed within the now cured thermoset binder material.

4,137,216

POST BULK POLYMERIZATION PROCESS FOR POLYVINYL HALIDE AND COMPOSITION THEREOF

Anthony L. Lemper, Tonawanda; Gilbert Witschard, Grand Island, and Victor A. Pattison, Clarence Center, all of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 711,672, Aug. 4, 1976, which is a continuation-in-part of Ser. No. 465,008, Apr. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 251,097, May 8, 1972, abandoned. This application Jun. 29, 1977, Ser. No. 811,215

Int. Cl.[2] C08K 9/06, 9/00; C08F 255/00, 255/06

U.S. Cl. 260—42.14 14 Claims

1. The process for the preparation of small particle size

polymer of vinyl halide by bulk liquid phase polymerization comprising the steps of:

(1) polymerization of a monomer composition comprising a vinyl halide monomer or a mixture of a vinyl halide monomer with an ethylenically unsaturated comonomer copolymerizable therewith, in a first stage using high speed agitation at a temperature of from about 30 to about 70 degrees centigrade in the presence of a water-free particle size control additive selected from the group consisting of:

(a) an inorganic or organic, inert, fine particle size material which is solid at least at the reaction temperature and insoluble in said monomer, said material having an average particle size in the range of about 0.001 to about 50 microns and said material being present in the amount of 0.001 to 5 percent by weight based upon said monomer composition present in said first stage;

(b) a surface active agent in an amount of 0.01 to 5 percent by weight based upon said monomer present in said first stage;

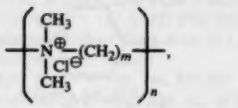
(c) a mixture of said inert, fine particle size material and said surface active agent; and

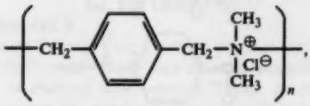
(d) a polyolefin in an amount of about 0.05 to about 4 percent by weight based upon said monomer composition present in said first stage; until about 3 to about 20 percent by weight of said monomer composition has been converted to polymer particles,

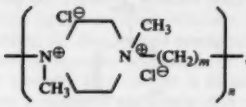
(2) continuing the preparation of small particle size polymers by polymerization in a second stage during which the reaction mixture is subjected to low speed agitation, until about 30 to about 95 percent by weight of the monomer composition has been converted to base polymer,

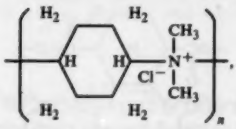
(3) introducing additional monomer into said second stage comprising at least one vinyl halide monomer or at least one comonomer which copolymerizes therewith or mixtures thereof and

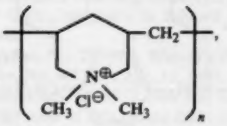
(4) carrying out the polymerization of said additional monomer in said second stage to provide non-porous polymer particles by increasing the second stage polymerization temperature after about 30 to about 80 percent by weight of said reaction mixture has been converted to polymer, from a range of about 30 to about 70 degrees centigrade to a range of about 60 to 80 degrees centigrade, said increase in polymerization temperature being about 10 to about 50 degrees centigrade, said second stage polymerization being carried out in the presence of a surface active agent added to said second stage polymerization reaction in an amount of about 0.01 to about 0.2 percent by weight based upon the weight of monomer composition added up to said point of surface active agent addition.

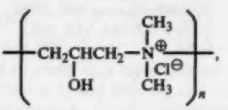


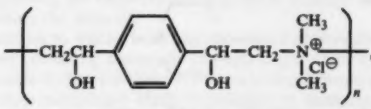


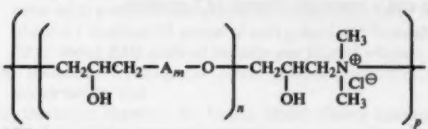












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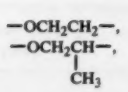

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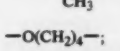

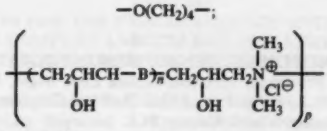

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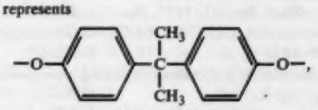
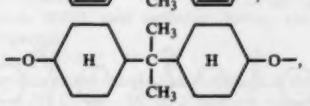
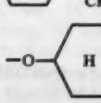






4,137,217

POLYION COMPLEX AND METHOD FOR PREPARING THE SAME

Eishun Tsuchida, 1-141, Sekimachi, Nerima-ku, Tokyo, Japan, and Yoshihito Osada, Yokohama, Japan, assignors to Eishun Tsuchida, Tokyo, Japan

Continuation of Ser. No. 373,954, Jun. 27, 1973, abandoned. This application Apr. 22, 1977, Ser. No. 790,085

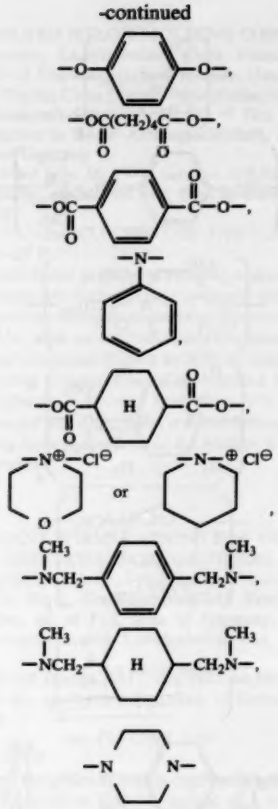
Claims priority, application Japan, Jul. 1, 1972, 47-66239

Int. Cl.[2] **C08F** *8/32;* **C08G** *69/34, 69/28*

U.S. Cl. 260—837 R **4 Claims**

1. A method for preparing a polyion complex which is fibrous or shapable into a mass or film consisting essentially of reacting at a temperature of zero to 80° C., a polycarboxylic acid selected from the group consisting of polyacrylic, polymethacrylic, polymaleic, polyitaconic, polyasparatic and polyglutamic acids having a polymerization degree of 5 or more with a polycation having the formula:

-continued



or

m, n and p represent integers of 5 or more.

4,137,218

THERMOPLASTIC BENZOPHENONE POLYESTER

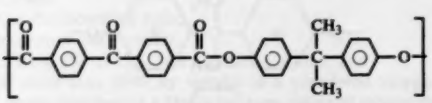
Dusan C. Prevorsek, Morristown, and Leon Segal, Randolph, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Jun. 17, 1977, Ser. No. 807,754

Int. Cl.[2] C08G *63/18, 63/24*

U.S. Cl. 528—126 **18 Claims**

1. A thermoplastic polyester consisting essentially of recurring units of the formula:



having an intrinsic viscosity of at least 0.85 deciliter/gram, as measured in 1:1 phenol/tetrachloroethane at 25° C.

4,137,219

POLYCONDENSATES CONTAINING HYDROXYQUINOLINE END GROUPS, THEIR USE FOR THE PREPARATION OF POLYMERS CONTAINING METALS AND METAL CONTAINING POLYCONDENSATES

Karsten Idel, Krefeld; Hugo Vernaleken, Krefeld-Bockum; Dieter Freitag, Krefeld, all of Germany; Günther Reiff, Santa Maria, Brazil, and Hans Rudolph, Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

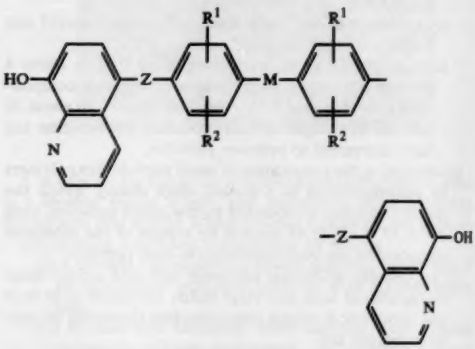
Division of Ser. No. 549,282, Feb. 12, 1975, abandoned. This application Aug. 17, 1977, Ser. No. 825,506

Claims priority, application Fed. Rep. of Germany, Feb. 15, 1974, 2407309

Int. Cl.[2] C08G *69/32, 69/42*

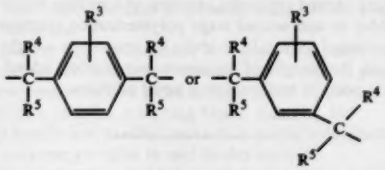
U.S. Cl. 528—177 **17 Claims**

1. A polyamide of the formula



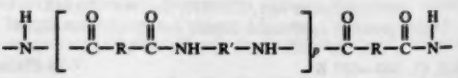
wherein

R^1 and R^2 are identical or different and denote hydrogen, (C_1–C_4)-alkyl, phenyl or halogen and Z is CH_2, CH—CH_3, an isoalkylidene radical with 3 to 5 carbon atoms, a cycloalkylene or cycloalkylidene radical with 5 to 15 carbon atoms, or a radical of the formula



in which

R^4, R^5 and R^3 are identical or different alkyl radicals with 1 to 5 carbon atoms, and M is a polyamide segment of the formula



wherein

R and R′ are identical or different and are C_2-C_{12}-alkylene which can be interrupted by -O- or cyclohexylene, C_5–C_{15} cycloalklyene, C_8–C_{12} arylenedialkylene, C_6–C_{12} arylene and C_{13}–C_{15} alkylidene diphenylene and p is an integer between 2 and 50.

4,137,220

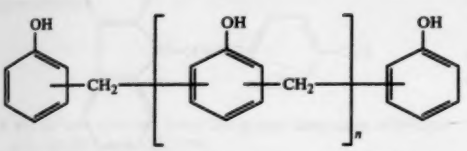
PREPARATION OF NOVOLAK EPOXY RESINS

Giorgio Lazzerini, Milan; Silvio Vargiu, Casatenovo (Como), and Mario Pitzalis, Arcore (Milan), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 6, 1976, Ser. No. 747,856
Claims priority, application Italy, Dec. 19, 1975, 30493 A/75
Int. Cl.[2] C08G *59/08*
U.S. Cl. 528—135 10 Claims

1. A method for the preparation of a Novolak epoxy resin, which comprises:

(a) gradually feeding an aqueous solution of alkali metal hydroxide into a solution in epichlorohydrin of a Novolak phenolic resin definable by the general formula:



where the average value of n is from 0 to 5, the ratio between the moles of epichlorohydrin and the number of phenolic hydroxyl groups in said epychlorohydrin solution being from 2.5:1 to 12:1, until the number of moles of alkali metal hydroxide fed in is substantially equivalent to the number of phenolic hydroxyl groups present in said epichlorohydrin solution, while maintaining the reaction medium at boiling point and at a temperature of from 60° to 80° C., distilling off water in the form of an azeotropic mixture with epichlorohydrin and recycling the distilled epichlorohydrin into the reaction medium, the addition of alkali metal hydroxide and the distillation conditions being adjusted so as to maintain in the reaction medium a water content of on the order of from 1 to 2.5 wt.% and a pH value between 7 and 8;

(b) distilling off the residual water present in the reaction medium and recovering the Novolak epoxy resin from the reaction products.

4,137,221

HEAT-CURABLE AND SOLVENT-SOLUBLE ESTER GROUP-CONTAINING POLYMER COMPOSITIONS AND PROCESS FOR THEIR PREPARATION

Shigeyoshi Hara, and Tateyoshi Yamada, both of Hino, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Jul. 7, 1975, Ser. No. 593,644
Claims priority, application Japan, Jul. 11, 1974, 49/78672; Sep. 30, 1974, 49/111649
Int. Cl.[2] C08J *3/00*; C08G *63/70*
U.S. Cl. 528—273 12 Claims

1. A process for producing a heat-curable and solvent-soluble ester group-containing polymer composition which comprises

(1) reacting a highly polymerized linear aromatic polyester having an intrinsic viscosity (η), measured on an o-chlorophenol solvent at 35° C., of above 0.3 (component 1) with 10 to 70 mole%, based on the total amount, in moles, of dibasic acid contained in the polyester, of a diaryl carbonate (component 2) to depolymerize the polyester and form a solvent-soluble low molecular weight polyester (component A) in which at least 30 mole% of the entire terminal groups are aryl carboxylate groups, and

(2) (i) mixing or (ii) partially reacting component A with a monomeric polyfunctional compound (component B) containing at least two reactive groups selected from the group consisting of a hydroxyl group, a primary amino group and a secondary amino group.

4,137,222

PROTEIN PRODUCT, A PROCESS FOR PREPARATION, AND APPLICATION OF SAID PRODUCT

Marie-France Makula, and Robert Plan, both of Lyon, France, assignors to Institut Merieux, France

Filed Apr. 11, 1975, Ser. No. 567,403
Claims priority, application France, Apr. 12, 1974, 74 13019
Int. Cl.[2] C07G *7/00*
U.S. Cl. 260—112 B 7 Claims

1. A process for preparing a protein product which is rich in gamma globulins and which also contains plasmin consisting essentially of diluting with water a Taylor precipitate III-1 fraction, treating the resulting solution with a 2-ethoxy-6,9-diamino acridine lactate solution whereby a precipitate is formed, eliminating the thus formed precipitate, adding to the resulting filtrate an aqueous semi-saturated ammonium sulphate solution whereby a precipitate is formed and isolating the thus formed precipitate containing said protein product which is rich in gamma globulins and which also contains plasmin.

4,137,223

METHOD OF PRESERVING BLOOD PLASMA II

Edward Shanbrom, Santa Ana, and Robert C. Bishop, Los Angeles, both of Calif., assignors to Edward Shanbrom, Inc., Santa Ana, Calif.

Continuation of Ser. No. 797,108, May 16, 1977, which is a continuation of Ser. No. 567,371, Apr. 11, 1975, abandoned. This application Sep. 19, 1977, Ser. No. 834,346
The portion of the term of this patent subsequent to Apr. 25, 1995, has been disclaimed.
Int. Cl.[2] A61K *37/02*
U.S. Cl. 260—112 B 1 Claim

1. The method of preserving blood plasma coagulation factors and other proteins during freezing and thawing of plasma for improving the recovery of coagulation proteins thereafter comprising the steps of:

(a) adding to whole, fresh blood plasma a preservative solution consisting essentially of heparin and alpha-hydroxy-omega-hydroxy-poly(oxyethylene)poly(oxypropylene)-poly(oxyethylene) block copolymer or mixtures of the same with polyethylene glycol to a concentration of from about 0.1 to about 25 grams of said polyol and from about 10 to about 2000 units of heparin per liter of plasma;

(b) thereafter freezing the blood plasma containing said preservative; and

(c) thereafter thawing the frozen blood plasma containing the preservative solution to recover therefrom plasma cryoprecipitate from which plasma proteins can be recovered in improved yield.

4,137,224

PROCESS FOR THE PREPARATION OF ANTIBIOTIC W-10 COMPLEX AND FOR THE ISOLATION OF ANTIBIOTIC 20561 AND ANTIBIOTIC 20562 THEREFROM

David Taplin, Miami, Fla.; Marvin J. Weinstein, East Brunswick, N.J.; Raymond T. Testa, Verona, N.J.; Joseph A. Marquez, Montclair, N.J., and Mahesh G. Patel, Verona, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Feb. 9, 1977, Ser. No. 767,102
Int. Cl.[2] A61K *31/71, 37/00*; C07H *17/00*
U.S. Cl. 260—112.5 R 2 Claims

1. Antibiotic **20561**, said antibiotic having the following physical properties:

(a) A melting point of 160°–166° C;

(b) A specific optical rotation as measured at the D line of sodium at 26° C., of $-88° \pm 3°$ at 0.4% concentration in pyridine containing 5% water and of $-66° \pm 2°$ at 4% concentration in dimethylsulfoxide containing 5% water;

(c) Ultraviolet absorption maxima in methanol at 220 and 280 mμ which $E_{1cm}^{1\%}$ of 313 and 20, respectively; and in

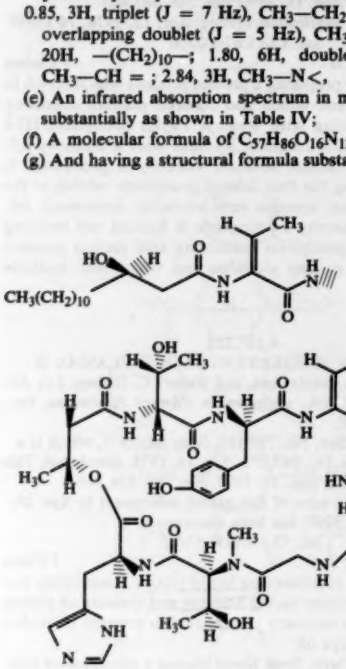
methanol containing 10% v/v 1N sodium hydroxide, maxima are observed at 240 and 295 mμ;

(d) A nuclear magnetic spectrum in deuterated dimethylsulfoxide containing the following characteristic absorption peaks in parts per million from tetramethylsilane (TMS): 0.85, 3H, triplet (J = 7 Hz), CH_3—CH_2—; 0.98–1.09, 9H, overlapping doublet (J = 5 Hz), CH_3—CH(O—); 1.21, 20H, —$(CH_2)_{10}$—; 1.80, 6H, doublet (J = 7 Hz), CH_3—CH = ; 2.84, 3H, CH_3—N<,

(e) An infrared absorption spectrum in mineral oil (Nujol) substantially as shown in Table IV;

(f) A molecular formula of $C_{57}H_{86}O_{16}N_{12}$;

(g) And having a structural formula substantially as follows:



4,137,225

NOVEL CHROMOGENIC ENZYME SUBSTRATES

Bo T. Af Ekenstam, Mölndal; Leif E. Aurell; Karl G. Claeson, both of Särö; Birgitta G. Karlsson; Stig I. Gustavsson, both of Mölndal, and Gun A. Olausson, Västra Frölunda, all of Sweden, assignors to Ab Kabi, Stockholm, Sweden

Continuation of Ser. No. 697,002, Jun. 17, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,586

Claims priority, application Sweden, Jul. 11, 1975, 7507974

Int. Cl.[2] C07C *103/52*; C12K *1/04*

U.S. Cl. 260—112.5 R **29 Claims**

1. Diagnostically active chromogenic substrate with a good solubility and a high specificity to serine proteases, having the following general formula:

H-D-A_1-A_2-A_3-NH-R

or salts thereof, wherein A_1 is an amino acid selected from the group consisting of Gly, Ala, Val, Leu, Ile, Pip, Pro, and Aze; A_2 is an amino acid selected from the group consisting of Gly, Ala, Val, Leu, Ile, Pip, Pro, Aze, and Phe; A_3 is an amino acid selected from the group consisting of Arg, Lys, and Orn; and R is a chromophoric group.

4,137,226

3,3-(1,1'-BIPHENYL-2,2'-DIYL)-1-(4-METHYLPHENYL)-1-TRIAZENE

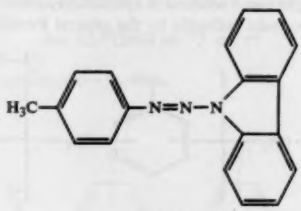
Lee D. Brodsky, Parsippany; Mark L. Moskowitz, Wayne, both of N.J., and Ralph G. D. Moore, Chenango Forks, N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 19, 1977, Ser. No. 861,669

Int. Cl.[2] C07C *107/04*

U.S. Cl. 260—140 **1 Claim**

1. The compound of 3,3-(1,1'-biphenyl-2,2'-diyl)-1-(4-methylphenyl)-1-triazene,



4,137,227

1-ALKYL-1,4-DIHYDRO-4-OXO-7-TRIAZENYL-3-QUINOLINECARBOXYLIC ACIDS

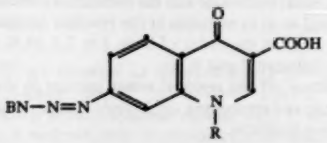
Andrew W. Zalay, Albany, and George Y. Lesher, Schodack, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,339

Int. Cl.[2] C07C *107/00*

U.S. Cl. 260—140 **6 Claims**

1. A compound having the formula



wherein

a. BN is dimethylamino where R is methyl, ethyl, n-propyl, n-butyl, n-pentyl or n-octyl;

b. BN is diethylamino where R is n-propyl; or

c. BN is 4-methyl-1-piperazinyl where R is ethyl.

4,137,228

WATER-SOLUBLE, COPPER CONTAINING TRISAZO COMPOUNDS HAVING A 2-(4'PHENYLENE)-BENZIMIDAZOYL-(5 OR 6),-BENZOXAZOLYL-(5), OR -BENZTHIAZOLYL-(5) COMPONENT

Wolfgang Bauer, Maintal, and Joachim Ribka, Offenbach (Main)-Bürgel, both of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

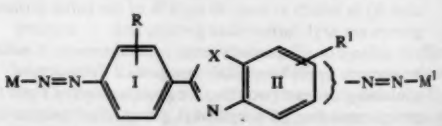
Filed Nov. 26, 1976, Ser. No. 745,177

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1975, 2553261

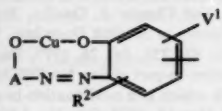
Int. Cl.[2] C09B *45/28, 45/48, 35/34, 35/38*

U.S. Cl. 260—146 R **12 Claims**

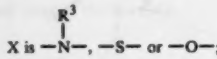
1. A water soluble trisazo dye having the formula



where one of M and M^1 is



and the other is a benzene or naphthalene coupling component radical containing one or two substituents which are selected from the group consisting of hydroxy and $-NR^6R^7$ groups and said benzene or naphthalene having additionally up to two substituents selected from the group consisting of lower alkyl, lower alkoxy, carboxy, sulfo, chloro, bromo, nitro, and lower alkoxycarbonyl;



R and R^1 are selected from the group consisting of hydrogen, methyl, and chlorine;

R^2 is hydrogen, lower alkyl, lower alkoxy, sulfo, $-NO_2$ or halogen;

R^3 is hydrogen, lower alkyl, phenyl or benzyl;

A is the 1,2-phenylene, 1,2-naphthylene or 2,3-naphthylene radical of a diazo component, which can additionally be mono-substituted or di-substituted by substituents selected from the group consisting of chlorine, $-SO_3H$, $-CO_2H$, $-SO_2NH_2$, $-SO_2NHCH_3$, $-SO_2N(CH_3)_2$, $-SO_2N(C_2H_5)$, nitro and alkyl having 1 to 2 carbon atoms;

V^1 being —OH or $-NR^4R^5$ and meta-positioned to the copper-containing bridge; each R^4 and R^5 independently is selected from the group consisting of hydrogen, lower alkyl, phenyl, lower alkylcarbonyl, sulfoalkyl with up to two carbon atoms,

hydroxyalkyl with up to two carbon atoms and carboxyalkyl with up to two carbon atoms in the alkyl moiety;

R^6 and R^7 are independently selected from the group consisting of hydrogen, lower alkyl, aryl having up to 12 carbon atoms, lower alkylcarbonyl, carboxy lower alkyl, sulfo lower alkyl and hydroxy lower alkyl; and the dye contains at least one sulfo or carboxy group present in acid or salt form.

4,137,229
PROCESS FOR PREPARING IMIDAZO[1,5-a][1,5]BENZODIAZEPINES

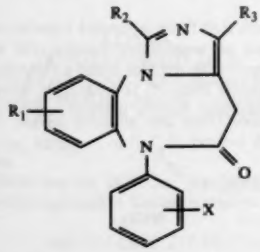
Armin Walser, West Caldwell, and Rodney I. Fryer, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 775,347, Mar. 7, 1977, Pat. No. 4,080,323. This application Feb. 1, 1978, Ser. No. 874,076

Int. Cl.[2] C07D *487/04*

U.S. Cl. 260—239.3 T 1 Claim

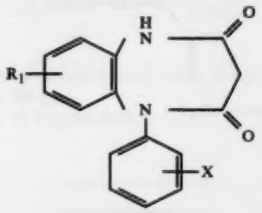
1. A process to produce a compound of the formula



wherein X is hydrogen or halogen; R_1 is hydrogen, halogen or trifluoromethyl; R_2 is hydrogen or lower alkyl; and R_3 is —COO lower alkyl or $CON(R_4)_2$ wherein R_4 is lower alkyl or hydrogen and may be different

which comprises:

A. reacting a compound of the formula



wherein R_1 and X are as above with methylamine in the presence of titanium tetrachloride

B. nitrosating the product of (A) with nitrous acid or nitrosyl chloride in pyridine in an aliphatic or aromatic hydrocarbon solvent at from −30° C. to room temperature;

C. condensing the product of (B) with the anion generated from malonic ester in a hydrocarbon solvent at from room temperature to 150° C.;

D. hydrolyzing and selectively decarboxylating the product of (C) by utilizing an alkali metal or alkaline metal hydroxide at from room temperature to reflux temperature;

E. nitrosating the product of (D) with nitrous acid, nitrosyl chloride or a lower alkyl nitrite in the presence of a chlorinated hydrocarbon at from about −20° C. to 100° C.;

F. reducing the product of (E) to the amino intermediate by hydrogen/Raney Ni or zinc in acetic acid at room temperature to 80° C.;

G. condensing the product of (F) to the closed ring compound by reaction with a reagent selected from the group consisting of orthoesters, amide acetals or orthoamides at from room temperature to reflux temperature;

H. converting the ester of (G) to the desired amide by reaction with lithium chloride in hexaalkylphosphorous triamide at from 180° C. to 250° C.

4,137,230
METHOD FOR THE PRODUCTION OF MAYTANSINOIDS

Naoto Hashimoto, Suita, and Toyokazu Kishi, Nakamachi, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

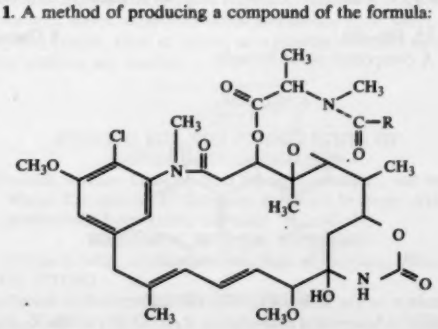
Filed Mar. 15, 1978, Ser. No. 886,815

Claims priority, application Japan, Nov. 14, 1977, 52/137078; Feb. 20, 1978, 53/18675

Int. Cl.[2] C07D *498/18*

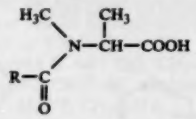
U.S. Cl. 260—239.3 P 11 Claims

1. A method of producing a compound of the formula:



wherein R is lower alkyl which comprises contacting, in the

presence of a carbodiimide, the compound maytansinol with an acid of the formula:



wherein R is lower alkyl.

4,137,231

PROCESS FOR THE ISOLATION OF 2-HYDROXYMETHYL-3,4,5-TRIHYDROXYPIPERIDINE FROM PLANT MATERIAL

Hiromu Murai, Otsu; Hiroshi Enomoto; Yoshiaki Yoshikuni, both of Kyoto; Tatsuhiko Kono, Kyoto, and Masahiro Yagi, Otsu, all of Japan, assignors to Nippon Shinyaku Co., Ltd., Kyoto, Japan

Filed Dec. 20, 1976, Ser. No. 752,149

Claims priority, application Japan, Dec. 29, 1975, 50/157423

Int. Cl.[2] C07D *211/46*

U.S. Cl. 546—242 **5 Claims**

1. The process which comprises extracting 2-hydroxymethyl-3,4,5-trihydroxypiperidine from plant material of the Morus genus with water or a polar organic solvent and isolating the 2-hydroxymethyl-3,4,5-trihydroxypiperidine from the resultant extract.

4,137,232

2,8-DISUBSTITUTED-10-HYDROXY-5,5-DIMETHYL-1,2,3,4-TETRAHYDRO-5H -[1]BENZOPYRANO[4,3-c]PYRIDINE

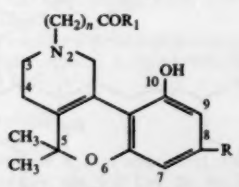
Harold E. Zaugg, Lake Forest, and Cheuk M. Lee, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 19, 1978, Ser. No. 897,620

Int. Cl.[2] C07D *491/04*

U.S. Cl. 546—89 **9 Claims**

1. A compound of the formula



wherein $n = 1$ or 2; R is a C_3–C_{20} alkyl, phenylalkyl, halophenylalkyl or loweralkyl phenylalkyl; R_1 is NR_2R_3 where R_2 and R_3 each are H, loweralkyl, phenylalkyl, halophenyl alkyl or loweralkyl phenyl.

4,137,233

1,2-DIHYDRO-2-OXO-5-(PYRIDINYL)NICOTINAMIDES

George Y. Lesher, and Chester J. Opalka, Jr., both of Schodack, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

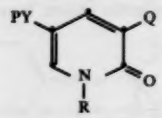
Division of Ser. No. 818,724, Jul. 25, 1977, Pat. No. 4,107,315, which is a continuation-in-part of Ser. No. 707,235, Jul. 21, 1976, Pat. No. 4,072,076, which is a continuation-in-part of Ser. No. 621,763, Oct. 14, 1975, Pat. No. 4,004,012.

This application Feb. 10, 1978, Ser. No. 876,571

Int. Cl.[2] C07D *213/56*

U.S. Cl. 546—257 **3 Claims**

1. A 1-R-3-Q-5-PY-2(1H)-pyridinone having the formula



where PY is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents, R is hydrogen, lower-alkyl or lower-hydroxyalkyl and Q is carbamyl, or pharmaceutically-acceptable acid-addition salt thereof.

4,137,234

THIAZOLE, ISOTHIAZOLE, OXAZOLE AND ISOXAZOLE SUBSTITUTED THIOUREA AND UREA COMPOUNDS

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to SmithKline & French Laboratories Limited, Welwyn Garden City, England

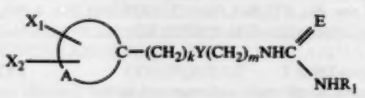
Division of Ser. No. 638,005, Dec. 5, 1975, Pat. No. 4,053,473, which is a division of Ser. No. 451,333, Mar. 14, 1974, Pat. No. 3,950,353, which is a continuation-in-part of Ser. No. 290,584, Sep. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Jun. 10, 1977, Ser. No. 805,491

Claims priority, application United Kingdom, Mar. 9, 1971, 6352/71; Jul. 22, 1971, 34334/71; Aug. 8, 1972, 37015/72; Ireland, Feb. 3, 1972, 136/72

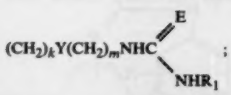
Int. Cl.[2] C07D *277/02*

U.S. Cl. 260—302 R **16 Claims**

1. A compound of the formula:



wherein A is such that there is formed together with the carbon atom shown an unsaturated heterocyclic nucleus, said unsaturated heterocyclic nucleus being a thiazole, isothiazole, oxazole or isoxazole ring; X_1 is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or



;

X_2 is hydrogen or when X_1 is lower alkyl, lower alkyl or halogen; k is 0 to 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is oxygen, sulphur or NH; E is oxygen or

sulphur; and R_1 is hydrogen, lower alkyl, benzoyl or di-lower alkylaminolower alkyl or a pharmaceutically acceptable addition salt thereof.

4,137,235
OXAZOLE ESTERS AND THEIR USE AS STABILIZERS IN ORGANIC COMPOSITIONS

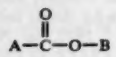
Gether Irick, Jr., and Charles A. Kelly, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 484,846, Jul. 1, 1974, abandoned. This application Dec. 17, 1976, Ser. No. 797,667

Int. Cl.[2] C07D *263/34*

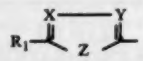
U.S. Cl. 260—307 R 8 Claims

1. A compound having the formula:



wherein

A is a member having the structure



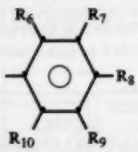
wherein

X is a carbon atom and Y is a nitrogen atom;

Z is an oxygen atom;

R_1 is hydrogen, chloro, bromo, lower alkyl, chloro substituted lower alkyl, cyclohexyl, phenyl, chlorophenyl, cyanophenyl, methoxy phenyl, lower alkylphenyl, phenyl-substituted-phenyl, alkoxy containing 1 to 20 carbon atoms, dimethyl amino, cyano, methylsulfonyl; and

B is a group having the formula



wherein

at least one R_6 or R_{10} is hydrogen and the other R_6, R_7, R_8, R_9 and R_{10} are hydrogen, lower alkyl, cyclohexyl, phenyl, lower alkylphenyl, phenyl-substituted-phenyl, alkoxy containing 1 to 20 carbon atoms, hydroxy, carboalkoxy wherein said alkyl radical of said carboalkoxy contains 1 to 20 carbon atoms, nitrile, chloro, and bromo.

4,137,236
AMINO-SPIRO[OXA(OR THIA)CYCLOALKANE-PENAM]-CARBOXYLIC

Ludovic Rodriguez, Brussels; Jacques Leclercq, Braine L'Alleud; Pierre Ykman, Brussels, and Eric Cossement, Brussels, all of Belgium, assignors to U C B, Société Anonyme, Brussels, Belgium

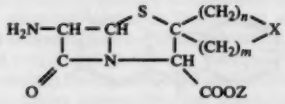
Filed Jan. 16, 1978, Ser. No. 869,859

Claims priority, application United Kingdom, Jan. 18, 1977, 1905/77

Int. Cl.[2] C07D *277/04*

U.S. Cl. 260—306.7 C 6 Claims

1. An amino-spiro [oxa(or thia)cycloalkane-penam]-carboxylic acid, a salt of an ester thereof, of the formula



wherein

Z is a hydrogen or an alkali metal atom, or a group protecting the carboxylic function,

X is a sulfur or oxygen atom,

n is 1 or 2,

m is 1 or 2.

4,137,237
PHARMACOLOGICALLY ACTIVE GUANIDINE COMPOUNDS

Graham J. Durant, Welwyn Garden City; John C. Emmett, Codicote, and Charon R. Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

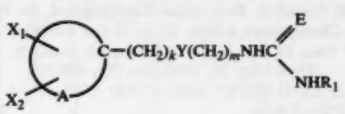
Division of Ser. No. 637,496, Dec. 4, 1975, Pat. No. 4,022,797, which is a division of Ser. No. 450,957, Mar. 14, 1974, Pat. No. 3,950,333, which is a continuation-in-part of Ser. No. 290,584, Sep. 20, 1972, abandoned, which is a continuation-in-part of Ser. No. 230,451, Feb. 29, 1972, abandoned. This application Feb. 2, 1977, Ser. No. 764,921

Claims priority, application Ireland, Feb. 3, 1972, 136/72

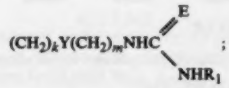
Int. Cl.[2] C07D *249/04, 249/08, 249/12, 249/14*

U.S. Cl. 260—308 R 6 Claims

1. A compound of the formula:



wherein A is such that there is formed together with the carbon atom shown an unsaturated heterocyclic nucleus, said unsaturated heterocyclic necleus being a triazole ring; X_1 is attached to triazole ring carbon and is hydrogen, lower alkyl, hydroxyl, trifluoromethyl, benzyl, halogen, amino or



X_2 is attached to triazole ring nitrogen and is hydrogen or when X_1 is lower alkyl, lower alkyl or when X_1 is hydrogen, benzyl; k is 0 to 2 and m is 2 or 3, provided that the sum of k and m is 3 or 4; Y is oxygen, sulphur or NH; E is NR_2; R_1 is hydrogen, lower alkyl or di-lower alkylamino-lower alkyl; and R_2 is hydrogen, nitro or cyano, or a pharmaceutically acceptable addition salt thereof.

4,137,238
PROCESS FOR THE PREPARATION OF 2-HYDROXYCARBAZOLES

Friedrich Werner, Cologne; Rolf Pütter, Dusseldorf, and Peter Wenzl, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

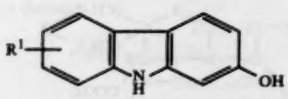
Filed Mar. 6, 1978, Ser. No. 883,980

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1977, 2711943

Int. Cl.[2] C07D *209/88*

U.S. Cl. 260—315 7 Claims

1. A process for the preparation of a 2-hydroxycarbazole of the formula

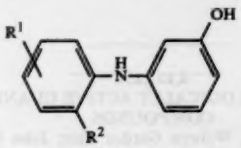


(I)

wherein

R^1 represents hydrogen, halogen or an optionally substituted alkyl, aryl or alkoxy radical

which comprises contacting a diphenylamine of the formula



(II)

wherein

R^1 has the above-described meaning and

R^2 represents halogen

with a base at an elevated temperature of from 150° to 400° C., in water and/or an organic solvent or diluent the ratio of base to diphenylamine being 0.1 to 10 the molar amount relative to diphenylamine.

4,137,239

p,p″ BIS-QUATERNARY AMMONIUM SALTS OF p-TERPHENYL AND METHOD OF PREPARING SAME

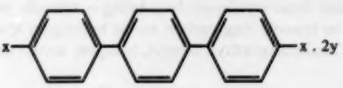
Nikolai V. Khromov-Borisov, ulitsa Nalichnaya, 36, korpus 9, kv. 214; Samuil F. Torf, ulitsa Kurchatova, 4, kv. 86; Valentina P. Cherepanova, 4 linia, 19, kv. 5, and Anatoly F. Danilov, V.O. 9 linia, 54, kv. 36, all of Leningrad, U.S.S.R.

Filed May 26, 1976, Ser. No. 689,979

Int. Cl.² C07D *403/10*; C07C *87/68*; A61K *31/14, 31/40*

U.S. Cl. 260—326.82 22 Claims

1. p,p″-bis-Quaternary ammonium salts of p-terphenyl of the formula



where $x = \overset{+}{N}(R)_2R'$

$x = \overset{+}{N}(CH_2)_4R'$ R and R′ are alkyl of from 1 to 3 carbon atoms

$y = C_6H_5\overline{SO}_3$, Hal.

9. A method for preparing p,p″-bis-quaternary ammonium salts of p-terphenyl according to claim 1, consisting in reduction of p,p″-dinitro-p-terphenyl to p,p″-diamino-p-terphenyl with hydrazine hydrate in the presence of Raney nickel in ethylene glycol at between 165° and 180° C; alkylation of p,p″-diamino-p-terphenyl to p,p″-bis(tertiary-amino)-p-terphenyls with alkyl iodides or tetramethylene dibromide; quaternization of p,p″-bis(tertiary-amino)-p-terphenyl with alkyl esters of benzenesulphonic acid to form p,p″-bis(quaternary-ammonium)-p-terphenyl benzenesulphonates.

4,137,240

HYDROFORMYLATION PROCESS FOR PREPARATION OF PREDOMINANTLY LINEAR ALDEHYDES

Marvin L. Peterson, Woodstown, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 753,455, Jan. 31, 1976, abandoned. This application Jun. 23, 1977, Ser. No. 809,188

Int. Cl.² C07D *319/04*

U.S. Cl. 260—340.7 11 Claims

1. In a process for the hydroformylation of a terminally unsaturated cyclic or acyclic olefinic compound having 3 to 20 carbon atoms in the presence of hydrogen and carbon monoxide at a molar ratio of 1:1 or greater of hydrogen to carbon monoxide and a rhodium complex catalyst to prepare a corresponding aldehyde, the improvement wherein the olefinic compound is a cyclic acetal of acrolein, the initial total pressure of carbon monoxide and hydrogen is from 40 to 500 psia, the initial partial pressure of the carbon monoxide is from 20 to 200 psia and the partial pressure of carbon monoxide is continuously or stepwise reduced at least 25% as the reaction proceeds from said initial range to a final range of 20 to 300 psia total pressure and 1 to 40 psia carbon monoxide partial pressure.

4,137,241

DEOXY-(0-8)-EPI-17-SALINOMYCIN (1)

Chao-Min Liu, and John Westley, both of Cedar Grove, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 7, 1977, Ser. No. 785,482

Int. Cl.² C07D *309/22*

U.S. Cl. 260—345.7 R 1 Claim

1. The compound:

deoxy-(0-8)-epi-17-salinomycin.

4,137,242

PROCESS FOR THE PREPARATION OF PROPYLENE OXIDE

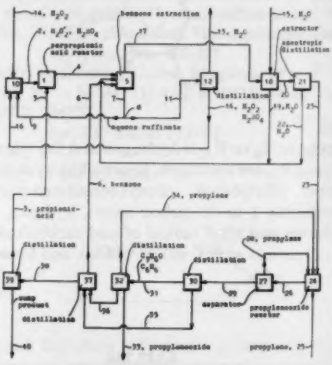
Günter Prescher; Gerd Schreyer, both of Hanau; Otto Weiberg, Neu-Isenburg; Rolf Wirthwein, Hanau; Helmut Waldmann, Leverkusen; Hermann Seifert, Cologne; Wulf Schwerdtel, Leverkusen, and Wolfgang Swodenk, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt am Main, both of, Fed. Rep. of Germany

Filed Apr. 28, 1976, Ser. No. 678,823

Claims priority, application Fed. Rep. of Germany, Apr. 30, 1975, 2519297

Int. Cl.² C07D *301/14*

U.S. Cl. 260—348.25 32 Claims



1. Process for the continuous production of propylene oxide from propylene and aqueous hydrogen peroxide which comprises:

(a) contacting aqueous hydrogen peroxide with propionic acid for reaction of hydrogen peroxide and propionic acid to form perpropionic acid, in the presence of a water-soluble acid catalyst for the reaction, the amount of water, catalyst and hydrogen peroxide corresponding to an aqueous solution of catalyst and hydrogen peroxide containing 10 to 40% by weight of catalyst and 20 to 30% by weight of hydrogen peroxide, and the molar ratio of hydrogen

peroxide to propionic acid being 3.5 to 5:1, at a temperature of 10 to 70° C.

(b) extracting the resulting reaction mixture with benzene for formation of benzene phase rich in perpropionic acid, propionic acid, and containing hydrogen peroxide, and aqueous raffinate phase rich in hydrogen peroxide and catalyst,

(c) treating at least part of the aqueous raffinate to remove water therefrom and form a concentrated solution of hydrogen peroxide and catalyst,

(d) recycling said concentrated solution of hydrogen peroxide and catalyst to step (a),

(e) extracting the benzene phase of step (b) with water for formation of a benzene phase containing perpropionic acid, propionic acid, water and a reduced amount of hydrogen peroxide, and an aqueous phase containing hydrogen peroxide.

(f) subjecting the benzene phase produced in step (e) to azeotropic distillation to reduce the water content thereof to less than 0.5% by weight.

(g) contacting the benzene phase of reduced water content of step (f) with propylene at a temperature of 40 to 100° C., and a pressure of 2 to 30 bars for reaction of perpropionic acid of the benzene phase with propylene to form propylene oxide and a reaction mixture containing the propylene oxide, and other materials,

(h) distilling the reaction mixture to distill overhead propylene, propylene oxide and benzene and removing bottoms comprising benzene and propionic acid;

(i) subjecting the overhead from step (h) to a second distillation to distill off overhead propylene and recycling said propylene to step (g);

(j) introducing the bottoms consisting essentially of propionic acid and benzene from the distillation of step (i) to a third distillation and distilling off overhead benzene and recycling said benzene to step (b).

(k) removing bottoms from said third distillation consisting essentially of propionic acid and materials of higher boiling point than propionic acid and introducing said bottoms into a fourth distillation and distilling over propionic acid and recycling said propionic acid to step (a) and separating bottoms consisting essentially of the material of higher boiling point than propionic acid, and

(l) recovering propylene oxide as a side cut from said second distillation.

4,137,243
POLYMERIC ANTHRAQUINONE DERIVED COLORANTS

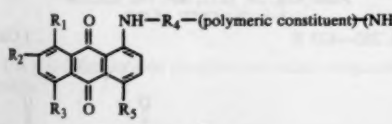
Larry B. Farmer, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Continuation-in-part of Ser. No. 717,143, Aug. 24, 1976, abandoned. This application Jul. 14, 1977, Ser. No. 815,486

Int. Cl.[2] C07C *97/24*

U.S. Cl. 260—378 **4 Claims**

1. Novel polymeric anthraquinone dervied colorants having improved light and alkali fastness properties represented by the formula



wherein R_1 is a member selected from the group consisting of H, OH, a halogen, NH_2, NO_2 and

R_2 and R_3 are members selected from the group consisting of H and OH, R_4 is an alkyl moiety containing at least 1 carbon atom, said polymeric constituent is a member of the group consisting of polypropylene oxide, copolymers of polyethylene oxide and polypropylene oxide and mixtures of polyethylene oxide and polypropylene oxide, polyalkylene polyamines in which the alkylene moiety contains from 2 to about 4 carbon atoms, polysaccarides, polyamides, and copolymers of vinyl amine and acrylamide, said polymeric constituent being further characterized as having a molecular weight of up to about 6,000, x is an integer of at least 1, and R_5 is selected from the group consisting of OR_6 wherein R_6 is H, an aryl moiety or an alkyl moiety containing from 1 to about 18 carbon atoms or NHR_7 wherein R_7 is an aryl moiety or R_4-(polymeric constituent)—$(NH_2)_x$ wherein R_4, polymeric constituent and x are as previously defined.

4,137,244
ASYMMETRIC SYNTHESIS OF OPTICALLY ACTIVE PROSTAGLANDINS

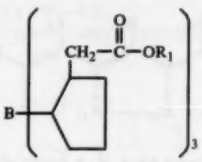
Naresh K. Chadha, Nutley; John J. Partridge, Jr., and Milan R. Uskokovic, both of Upper Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 623,205, Oct. 16, 1975, abandoned, which is a division of Ser. No. 434,539, Jan. 18, 1974, Pat. No. 3,933,892, which is a continuation-in-part of Ser. No. 331,931, Feb. 12, 1973, abandoned. This application Sep. 19, 1977, Ser. No. 834,369

Int. Cl.[2] C07C *69/7.4*

U.S. Cl. 260—395 **1 Claim**

1. A racemate of the formula:



wherein R_1 is lower alkyl, or benzyl, trityl or benzhydryl; and

the boron substituent is attached to the cyclopentene moiety on the opposite sides of the plane as the methylenecarboxy ester.

4,137,245
NITROGENOUS CONDENSATION PRODUCTS

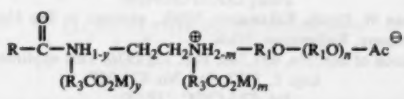
Arvid Christiansen, North Arlington, N.J., assignor to The Miranol Chemical Company, Inc., Irvington, N.J.

Division of Ser. No. 598,092, Jul. 22, 1975, Pat. No. 4,044,034. This application May 19, 1977, Ser. No. 798,279

Int. Cl.[2] C09F *5/00*

U.S. Cl. 260—404.5 **6 Claims**

1. A nitrogenous compound of the formula



wherein R_3CO_2M is the residue of a monocarboxylic acid of 2 to 5 carbon atoms;

n is 0 to 4;

y is 0 or 1;

m is from 0 to 2;

M is selected from the group consisting of hydrogen and a cation;

Ac is a saturated residue of an α,β-unsaturated dicarboxylic acid of 4 or 5 carbon atoms wherein the carboxylic acid groups are on adjacent carbon atoms and the double bond is between the two carbon atoms or immediately adjacent

to one of them and wherein one of the carboxylic acid groups may be neutralized with a base or esterified with an alcohol of 1–6 carbon atoms

R is an alkyl of alkenyl group of 5–25 carbon atoms and each R_1 is alkylene of 2–4 carbons and may be the same or different.

5. A compound according to claim 4 wherein

R is undecyl

m is from 1 to 1.5

R_3 is methylene

and Ac is a saturated residue of an α,β-unsaturated dicarboxylic acid selected from the group consisting of maleic, fumaric and itaconic acids wherein one of the carboxylic acid groups may be neutralized with a base or esterified with an alcohol of 1 to 6 carbon atoms.

4,137,246
FLUORINATED AROMATIC POLYENES

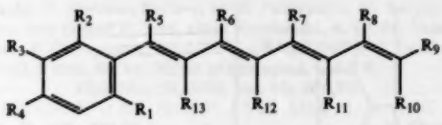
Ka-Kong Chan, Hopatcong, and Beverly A. Pawson, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 722,939, Sep. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 632,028, Nov. 14, 1975, abandoned. This application Jun. 24, 1977, Ser. No. 809,738

Int. Cl.² C09F *7/00*; C11C *3/00*

U.S. Cl. 260—408 **17 Claims**

1. A compound represented by the formula



wherein R_1, R_2 and R_3 are lower alkyl, R_4 is lower alkoxy, R_6 and R_8 are methyl or trifluoro methyl, R_9 is alkoxycarbonyl, lower alkenoxycarbonyl and lower alkynoxycarbonyl; R_5, R_7, R_{10}, R_{12} and R_{13} are hydrogen or fluorine with the proviso that at least one of R_5, R_7, R_{10}, R_{12} or R_{13} is fluorine or at least one of R_6 or R_8 is trifluoro methyl.

2. The compound of claim 1, 9-(4-methoxy-2,3,6-trimethylphenyl)-2-fluoro-3,7-dimethyl-2(Z),4(E),6(E),8(E)-nonatetraenoic acid ethyl ester.

4,137,247
CIS-4-5-DIDEHYDRO-13,14-DIDEHYDRO-11-DEOXY-PGE$_1$ COMPOUNDS

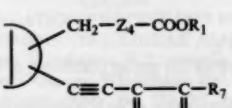
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 657,740, Feb. 13, 1976. This application Aug. 1, 1977, Ser. No. 821,057

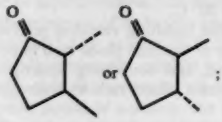
Int. Cl.² C07C *177/00*

U.S. Cl. 260—408 **73 Claims**

1. A prostaglandin analog of the formula



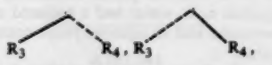
wherein D is



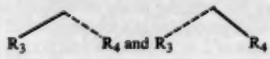
wherein Z_4 is cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—, wherein g is one, 2, or 3;

wherein R_7 is —$(CH_2)_m$—CH_3, wherein m is one to 5, inclusive;

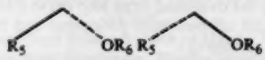
wherein L_1 is



or a mixture of



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl; wherein M_1 is



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,137,248
COMPOUND, 4-CARBOXYPHTHALATO(1,2-DIAMINOCYCLOHEXANE)-PLATINUM(II) AND ALKALI METAL SALTS THEREOF

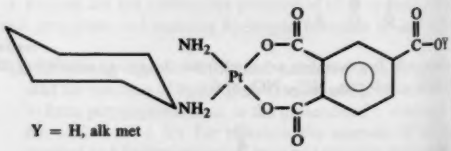
Glen R. Gale, and Paul Schwartz, both of Charleston, S.C., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Aug. 29, 1977, Ser. No. 828,926

Int. Cl.² C07F *15/00*

U.S. Cl. 260—429 R **1 Claim**

1.



Y = H, alk met

4-carboxyphthalato(1,2-diaminocyclohexane)platinum(II) and alkali metal salts thereof.

4,137,249
SILICON-TIN COMPOUNDS

Ernst Wohlfarth; Wolfgang Hechtl, and Paul Hittmair, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed May 27, 1976, Ser. No. 690,683
Claims priority, application Fed. Rep. of Germany, May 30, 1975, 2524000
Int. Cl.[2] C07F 7/22
U.S. Cl. 260—429.7 10 Claims

1. A crystalline compound of the general formula

$$R_aSi(OSnR^1R^2OOCR^3)_{4-a}$$

which is obtained from the reaction of a silane having the formula

$$R_aSi(OR^4)_{4-a}$$

with a dialkyltin salt of the formula

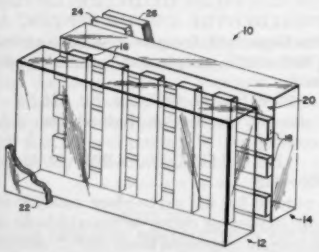
$$R^1R^2Sn(OOCR^3)_2,$$

in a mol ratio of (4−a) mols of dialkyltin salt per mol of silane, R is an alkyl radical having up to 4 carbon atoms, R^1, R^2 and R^3, each represent an alkyl radical, R^4 is a monovalent hydrocarbon radical having up to 4 carbon atoms and a is 1.

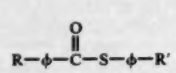
4,137,250
LIQUID CRYSTAL COMPOUNDS AND COMPOSITION

Reese M. Reynolds, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 554,937, Mar. 3, 1975, abandoned. This application Jan. 19, 1977, Ser. No. 760,594
Int. Cl.[2] C07C 153/11; C09K 3/34; G02F 1/13
U.S. Cl. 260—455 R 2 Claims



1. A p-p'- disubstituted phenylbenzthiolate compound of the formula



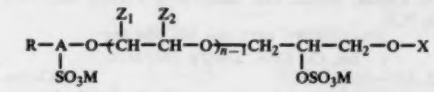
where ϕ is a benzene ring containing hydrogen atoms at other than the para position, and R and R' are, independently in each case, an alkyl or aryl group containing from 1 to 8 carbon atoms with at least one of R and R' having at least 2 carbon atoms, a nitro group or fluorine.

4,137,251
ANIONIC ARALIPHATIC COMPOUNDS

Alfred Berger, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 26, 1977, Ser. No. 836,639
Claims priority, application Luxembourg, Oct. 6, 1976, 75947; Feb. 16, 1977, 76778
Int. Cl.[2] C07C 141/14, 141/16; D06P 3/24
U.S. Cl. 260—458 C 8 Claims

1. An anionic araliphatic compound of the general formula



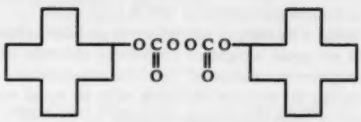
wherein
A is a mono- or binuclear aromatic radical,
R is alkyl having 4 to 22 carbon atoms,
X is alkyl having 1 to 18 carbon atoms, of Z_1 and Z_2, one is hydrogen and the other is hydrogen or methyl,
M is a cation, and n is 1 to 21.

4,137,252
DICYCLODODECYL PEROXYDICARBONATE

Takeshi Komai, Aichi; Kazuo Matsuyama, Gamagori, and Kazuhiro Mizuno, Aichi, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1977, Ser. No. 804,869
Claims priority, application Japan, Jun. 16, 1976, 51/69719
Int. Cl.[2] C07C 179/18
U.S. Cl. 260—463 1 Claim

1. Dicyclododecyl peroxycarbonate of the formula

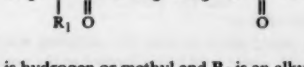


4,137,253
PREPARATION OF CHLOROFORMATES HAVING TERMINAL ACRYLIC OR METHACRYLIC GROUPS

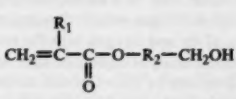
Marc D. Piteau, Mennecy, and Jean-Pierre G. Senet, Melun, both of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Nov. 28, 1977, Ser. No. 855,183
Claims priority, application France, Dec. 10, 1976, 76 37198
Int. Cl.[2] C07C 68/02
U.S. Cl. 260—463 7 Claims

1. A process for the preparation of a chloroformate of formula



wherein R_1 is hydrogen or methyl and R_2 is an alkylene of 1 to 10 carbon atoms which consists of introducing a solution of one acrylate or methacrylate of formula



wherein R_1 and R_2 are as defined hereinabove and an acid acceptor selected from the group consisting of tertiary alkylamines and heterocyclic amines of aromatic character, in an

inert solvent into a solution of phosgene in the same inert solvent or in a solvent which is miscible with said solvent, said phosgene being present in an at least 10% excess with respect to the stoichiometric amount, at a temperature of from −20° C. to +5° C., while stirring, and isolating said chloroformate from the reaction mixture.

4,137,254

PREPARATION OF AROMATIC NITRILES

John M. Larkin, Austin, Tex., assignor to Texaco, Inc., New York, N.Y.

Filed Jul. 27, 1977, Ser. No. 819,512
Int. Cl.[2] C07C *120/14, 121/78*
U.S. Cl. 260—465 E 28 Claims

1. A method for preparing an aromatic nitrile which comprises contacting a methylated aromatic hydrocarbon having 1 to 4 methyl groups with ammonia and a nitroaromatic hydrocarbon having 1 to 2 nitro-groups in the presence of an ammoxidation catalyst comprising two or more oxides of the metals of Groups I B, III B, V A, VI B, VII B, and VIII of the Periodic Table at a temperature of from about 419 to 950° F.

4,137,255

PROCESS FOR SEPARATION OF NITROGLYCERIN FROM MIXTURES WITH DIETHYLENE GLYCOL

David W. Endicott, Jr., Brigham City; Charles L. Denton, North Ogden, and Michael L. Levinthal, Brigham City, all of Utah, assignors to Thiokol Corporation, Newtown, Pa.

Filed Jan. 19, 1978, Ser. No. 870,773
Int. Cl.[2] C07C *77/02*
U.S. Cl. 260—467 1 Claim

1. A process for the separation of nitroglycerin from mixtures of diethylene glycol and nitroglycerin without the formation of undiluted nitroglycerin which comprises:

(a) treating a mixture of nitroglycerin and diethylene glycol with an equal weight of methylene chloride to form a homogeneous solution of the three components;

(b) treating the solution of step a with an equal volume of water to form a two phase system;

(c) separating and recovering the heavier organic phase of the two phase system of step b from the lighter aqueous phase of said two phase system; and

(d) repeating the aqueous partitioning of the organic phase of step c as in steps b and c until said organic phase contains up to the minimum acceptable quantity of diethylene glycol.

4,137,256

PREPARATION OF PERACETIC ACID BY OXIDATION OF ACETALDEHYDE

Gerald H. Slattery, Pasadena, Md., and Leonard Seglin, New York, N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Continuation of Ser. No. 764,079, Oct. 1, 1968, abandoned. This application Feb. 3, 1976, Ser. No. 654,953
Int. Cl.[2] C07C *179/12*
U.S. Cl. 260—502 A 8 Claims

1. In the vapor phase process for oxidizing acetaldehyde to peracetic acid, acetic acid being formed at the same time, in an elongated reaction zone maintained at a temperature between 140° C. and 180° C., the improvement which comprises introducing acetaldehyde into a steady-plate plug-flow reactor while introducing an oxygen containing gas selected from the group consisting of air and oxygen into the reactor at a plurality of at least three oxygen injection sites spaced along the reactor in the direction of travel of the reaction mixture and maintaining reaction gas velocities through the reaction zone in the areas of the oxygen injection sites in excess of the flame velocity of the reaction gas mixture of between 5.2 and 452 feet per second.

4,137,257

TERPENE HYDROXYSULFONIC ACIDS AND CORRESPONDING HYDROXYSULFONATE SALTS

Sean G. Traynor, Jacksonville, Fla., assignor to SCM Corporation, New York, N.Y.

Filed Apr. 3, 1978, Ser. No. 893,242
Int. Cl.[2] C07C *143/22, 99/12;* C11D *1/12*
U.S. Cl. 260—503 21 Claims

1. A compound containing the saturated or non-aromatically unsaturated, carbon skeleton of para-menthane, said skeleton containing adjacently a hydroxyl group and a sulfonate salt or sulfonic acid group; the unsaturated sulfonate salt or sulfonic acid dehydration products of said compound; the β-keto-sulfonate salt or sulfonic acid oxidation products of said compound; and the C_1–C_{10} alkyl esters of said unsaturated sulfonic acid or said β-keto-sulfonic acid.

4,137,258

PROCESS FOR MAKING PURE SALICYLIC ACID

Eugene R. Moore; Roger L. Briggs; David C. McDonald, and Richard Hoffman, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 7, 1978, Ser. No. 894,222
Int. Cl.[2] C07C *65/10*
U.S. Cl. 562—477 4 Claims

3. A method of making salicyclic acid of high purity from sodium salicylate in a continuous, two-step acidification process comprising the steps of:

(a) in the first step, sodium salicylate in the solid phase is contacted at a reaction temperature below its softening point with a gas stream containing a greater than stoichiometric amount of gaseous, anhydrous hydrogen chloride to effect substantially complete acidification and the salicylic acid product is contemporaneously sublimed into the gas stream;

(b) in the second step, the gas stream contacts a greater than stoichiometric amount of sodium salicylate in the solid phase at reactive conditions so as to effect acidification to the substantially complete exhaustion of the hydrogen chloride remaining in the gas stream, the salicylic acid product is contemporaneously sublimed and the unreacted sodium salicylate is cycled back to the first step.

4,137,259

CATALYTIC GAS PHASE OXIDATION OF TOLUENE TO BENZALDEHYDE AND/OR BENZOIC ACID

Paul C. Van Geem, and Antonius J. J. M. Teunissen, both of Geleen, Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Jun. 29, 1977, Ser. No. 811,321
Claims priority, application Netherlands, Jul. 9, 1976, 7607598
Int. Cl.[2] C07C *51/33;* B01J *29/16*
U.S. Cl. 562—415 8 Claims

1. In a process for the vapor-phase catalytic oxidation of toluene with oxygen or ozone to benzaldehyde and benzoic acid at a temperature between about 300° C. and about 500° C. in the presence of a silver vanadate catalyst, the improvement consisting essentially in carrying out said oxidation reaction in the presence of a catalyst mass composed of silver vanadate and iron vanadate as the catalytically active components.

6. In a process for the vapor-phase catalytic oxidation of toluene with oxygen or ozone to benzaldehyde and benzoic acid at a temperature between about 300° C. and about 500° C. in the presence of a silver vanadate catalyst,

the improvement consisting essentially in carrying out said oxidation reaction in the presence of a catalyst mass composed of silver vanadate with iron vanadate and a vanadate of at least one rare earth metal as the catalytically active components.

4,137,260

PROCESS FOR PRECIPITATION OF CARBOXYALKOXY SUCCINATE TETRAHYDRATE SALT

Thomas J. Walter, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 3, 1977, Ser. No. 765,214
Int. Cl.[2] C07C *59/23*
U.S. Cl. 562—580 15 Claims

1. A process for producing predominantly tetrahydrate alkali metal, ammonium or amine salt of carboxyalkoxy succinic acid from an aqueous solution containing said salt which comprises forming a supersaturated system by combining said solution with (1) lower alkanol having from 1 to about 3 carbon atoms per molecule, and (2) tetrahydrate, pentahydrate or mixed tetrahydrate and pentahydrate seed, said system containing from about 30 to about 65 percent by weight of alcohol, from about 20 to about 50 percent by weight of water and from about 10 to about 30 percent salt, maintaining a system temperature of from about 45 to about 75° C. for a finite period wherein precipitation occurs, and recovering a precipitate of predominantly tetrahydrate salt from said system.

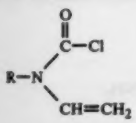
4,137,261

MANUFACTURE OF N-VINYL-N-ALKYL-CARBAMIC ACID CHLORIDES

Karl-Heinz Koenig, Frankenthal; Christian Reitel, Heidelberg, and Dietrich Mangold, Neckargemuend, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 27, 1976, Ser. No. 754,598
Claims priority, application Fed. Rep. of Germany, Jan. 16, 1976, 2601542
Int. Cl.[2] C07C *125/03*
U.S. Cl. 260—544 C 10 Claims

1. A process for the manufacture of N-vinyl-N-alkylcarbamic acid chlorides of the formula



I

where R is isopropyl, isobutyl, tertiary amyl or tertiary butyl, by reacting Schiff bases of the formula

$$R-N=CH-CH_3 \qquad \text{II}$$

where R has the above meanings, with phosgene in the presence of tertiary amines and separating off the end product I, wherein, after the reaction, excess phosgene is removed and the reaction mixture is treated with water, the aqueous phase thus formed, and the tertiary amine salts contained therein, are separated off and the end product is then isolated from the organic phase in the conventional manner.

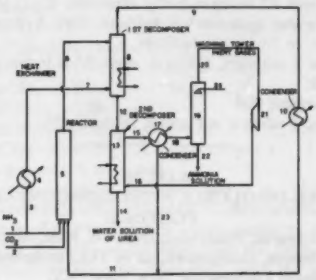
4,137,262

PROCESS FOR THE PRODUCTION OF UREA

Mario Guadalupi, Milan; Umberto Zardi, San Donato Milanese, and Vincenzo Lagana, Milan, all of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Continuation of Ser. No. 477,048, Jun. 6, 1974, Pat. No. 3,984,469, which is a continuation of Ser. No. 81,475, Oct. 16, 1970, abandoned. This application Jun. 15, 1976, Ser. No. 696,405
Claims priority, application Italy, Oct. 16, 1969, 23440 A/69
The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.
Int. Cl.[2] C07C *126/02*
U.S. Cl. 260—555 A 4 Claims

1. A process for the production of urea from CO_2 and NH_3 which comprises reacting CO_2 and NH_3 in a reactor to form a liquid reaction product containing unreacted carbamate, CO_2, NH_3 and water, passing said liquid reaction product containing said unreacted carbamate, CO_2, NH_3 and water into the upper end of a first stage decomposer maintained at substantially the same pressure as said reactor, in the absence of a stripping agent heating said liquid reaction product and said water in said first stage decomposer and thermally decomposing and separating a major amount of carbamate from said liquid reaction product in said first stage decomposer, passing the liquid



effluent remaining after said thermal decomposition and separation in said first stage decomposer from the lower end of said first stage decomposer into the upper end of a second stage decomposer maintained at substantially the same pressure as said reactor and said first stage decomposer and separating the unreacted compounds from said liquid effluent by contacting said liquid effluent in said second stage decomposer with a stripping stream of inert gas and removing from the lower end of said second stage decomposer, as finished product, a water solution of substantially pure urea.

4,137,263

PROCESS FOR THE EVAPORATION OF CYCLOHEXANONE OXIME

Otto Immel; Bernd-Ulrich Kaiser; Hans-Helmut Schwarz, and Klaus Starke, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sep. 9, 1977, Ser. No. 831,790
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1976, 2641414
Int. Cl.[2] C07C *131/04*
U.S. Cl. 260—566 A 3 Claims

1. A process for the evaporation of cyclohexanone oxime, which comprises evaporating the cyclohexanone oxime in the presence of an inert gas at a superatmospheric pressure of at least 300 Torr, the evaporation temperature being maintained in the range of from 110° to 160° C. by adjusting the inert gas pressure and/or by adjusting the ratio of cyclohexanone oxime to inert gas.

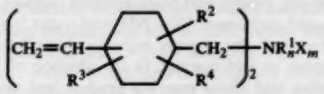
4,137,264

PREPARATION, POLYMERIZATION, AND USE OF NEW BIS-VINYLBENZYL NITROGENOUS MONOMERS

Frank L. Glavis, Rydal, and David H. Clemens, Willow Grove, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 593,906, Jul. 7, 1975, abandoned. This application Mar. 21, 1977, Ser. No. 779,426
Int. Cl.[2] C07C *87/30*; C08F *36/00*; C07C *87/29*
U.S. Cl. 260—567.6 M 4 Claims

1. A crosslinking and/or function-introducing bis-(vinylbenzyl) amine monomer represented by the formula



wherein:

R^1 is a C_{1-16} alkyl, aryl, or aralkyl radical or a hydrogen radical;

R^2, R^3 and R^4 independently represent C_{1-16} saturated or unsaturated hydrocarbyl, halogen, nitro, hydroxy, alkoxy, amino, or hydrogen radicals;

n is 1 or 2 wherein, if n is 2, each R^1 is independently selected;

X is an anion; and

m is 0 or 1 when n is 1 and 2, respectively.

4,137,265

WATER-INSOLUBLE NITROGEN-CONTAINING POLYOLS

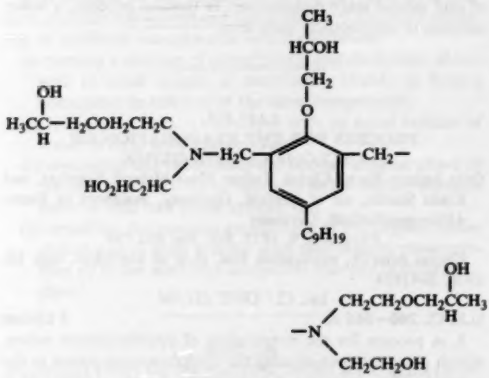
Gayle D. Edwards, Nederland; Doris M. Rice, Austin, and Robert L. Soulen, Georgetown, all of Tex., assignors to Texaco Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 682,560, Nov. 13, 1967, abandoned, which is a continuation-in-part of Ser. No. 288,474, Jun. 17, 1963, abandoned. This application Jan. 28, 1976, Ser. No. 110,599

Int. Cl.² C07C *87/28*

U.S. Cl. 260—570.9 **1 Claim**

1. A water-insoluble polyol having the property of self-catalyzing reaction with organic polyisocyanates to form rigid polyurethane foam said polyol having the formula



4,137,266

PROCESS FOR TOLUENE DIAMINE RECOVERY

John R. Cassata, Beaverton, Oreg., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 726,852, Sep. 27, 1976, abandoned. This application Sep. 15, 1977, Ser. No. 833,416

Int. Cl.² C07C *85/20, 85/26*

U.S. Cl. 260—578 **11 Claims**

1. In a process for the preparation of toluene diamine which comprises hydrolyzing, at a temperature of about 150°–350° C., a substantially solvent-free residue obtained from the distillation of the product of phosgenating toluene diamine, the improvement characterized by first transforming said residue into a granular material by heating it, in the presence of aqueous ammonia, to a temperature of about 25° to about 65° C., and then effecting the hydrolysis of said residue by heating it, in the presence of an aqueous solution of ammonia, to a temperature of about 150° to about 350° C.

4,137,267

CATALYTIC HYDROGENATION PROCESS

Robert E. Reid, Houston, Tex., and Hyung K. Zang, Hopewell Junction, N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 22, 1977, Ser. No. 770,339

Int. Cl.² C07C *85/00*; C07B *29/00*

U.S. Cl. 260—583 P **14 Claims**

1. A catalytic hydrogenation process for preparing C_{10} to C_{30} alkyl-1,3-diaminopropanes which comprises

contacting a C_{10} to C_{30} alkyl aminopropionitrile or mixtures thereof and an organic solvent having a normal boiling point of about 85 to 175° F. in the liquid phase with hydrogen and ammonia, wherein the volume ratio of gaseous hydrogen and ammonia to liquid nitrile and solvent is about 10:1 to about 100:1, in the presence of a hydrogenation catalyst at a reaction temperature of between about 180° F. and 260° F. and a pressure of between about 200 and 1000 p.s.i.g.

wherein said contacting is conducted non-isothermally at an increasing reaction temperature with progressive vaporization of said solvent and under sufficient pressure to prevent complete vaporization of said solvent, where the increase in reaction temperature is between 5 and 40° F.

4,137,268

METHOD OF PREPARING AMINOACETALDEHYDE ACETALS BY THE HYDROGENATION OF DIALKOXYACETONITRILE

Gerhard Daum, Cologne, and Wilhelm Vogt, Cologne-Süz, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

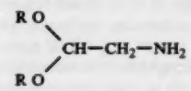
Filed Aug. 25, 1976, Ser. No. 717,789

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1975, 2538231

Int. Cl.² C07C *85/12*

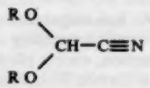
U.S. Cl. 260—584 C **8 Claims**

1. A process for preparing an aminoacetaldehyde acetal of the formula



wherein

R is a C_1–C_4 alkyl radical which comprises contacting a dialkoxyacetonitrile of the formula



wherein

R has the meaning given above, in the presence of a solvent with hydrogen under an elevated pressure at a temperature of 50°–180° C., wherein the sole solvent is liquid ammonia.

4,137,269

D-HOMOSTEROIDS

Leo Alig, Liestal; Andor Fürst, Basel; Marcel Müller, Frenkendorf, all of Switzerland; Ulrich Kerb; Klaus Kieslich, and Rudolf Wiechert, all of Berlin, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 12, 1976, Ser. No. 731,238

Claims priority, application Switzerland, Oct. 22, 1975, 13665/75; Jul. 30, 1976, 9762/76

Int. Cl.² C07J *63/00*

U.S. Cl. 260—586 E **2 Claims**

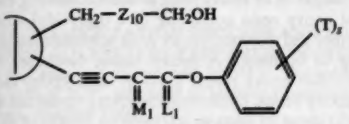
1. 9-Fluoro-17a-hydroxy-D-homopregna-1,4-diene-3,11,20-trione.

4,137,270
1-DECARBOXY-2-HYDROXYMETHYL-13,14-DIDEHYDRO-ω-ARYL-PG COMPOUNDS

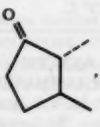
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 708,752, Jul. 26, 1976, Pat. No. 4,058,564. This application Jul. 11, 1977, Ser. No. 814,410
Int. Cl.[2] C07C *49/76*
U.S. Cl. 260—590 C 68 Claims

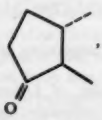
1. A prostaglandin analog of the formula

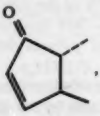


wherein D is

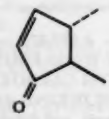


R_8

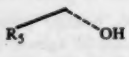




or

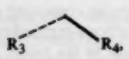


wherein R_8 is hydrogen or hydroxy;
wherein M_1 is



or

wherein R_5 is hydrogen or methyl;
wherein L_1 is



or a mixture of

and

wherein R_3 and R_4 are hydrogen or methyl being the same or different;
wherein Z_{10} is
(1) cis-CH=CH—CH—$(CH_2)_g$—CH_2—
(2) cis-CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(3) cis-CH_2—CH=CH—$(CH_2)_g$—CH_2—,
(4) —$(CH_2)_3$—$(CH_2)_g$—CH_2—,
(5) —$(CH_2)_3$—$(CH_2)_g$—CF_2— or
(6) —CH_2—O—CH_2—$(CH_2)_g$—CH_2—,
wherein g is one, 2, or 3; and
wherein s is one to 3, inclusive and T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, with the proviso that not more than two are other than alkyl, with the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different.

4,137,271
PROCESS FOR OXIDATION OF 1-PROPANOL

Alvin B. Stiles, and David C. England, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 639,246, Dec. 9, 1975, abandoned. This application Sep. 28, 1977, Ser. No. 837,631
Int. Cl.[2] C07C *45/00, 45/02*
U.S. Cl. 260—604 R 4 Claims

1. A process for the oxidation of 1-propanol to acrolein comprising the steps
(a) forming a vaporous admixture comprising 0.5–5 moles of O_2 per mole of 1-propanol; and
(b) contacting the vaporous admixture in rapid sequence with a two-stage catalyst system for a period of from 0.1 to 60 seconds in each stage at a temperature of from 350 to 500° C. and at a pressure of 0.5–6 atm, the catalyst system consisting essentially of
(1) a first bed of dehydration catalyst selected from the group consisting of boron phosphate, coprecipitated SiO_2/Al_2O_3 and coprecipitated WO_3/Al_2O_3; and
(2) a second bed of oxidation catalyst selected from the group consisting of mixed oxides of Fe, Co, Ni, Bi, P, Mo and K, mixed oxides of Fe, Co, W, Bi, Mo and Mg, mixed oxides of Sb and U, bismuth molybdate, bismuth phosphomolybdate, and mixtures of such catalysts.

4,137,272
PROCESS FOR THE MANUFACTURE OF 2-ALKOXY-6-BROMO-NAPHTHALENES

Theodor Papenfuhs, Frankfurt am Main, and Kurt Gengnagel, Offenbach am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 28, 1977, Ser. No. 791,854
Claims priority, application Fed. Rep. of Germany, May 4, 1976, 2619641
Int. Cl.[2] C07C *41/10*
U.S. Cl. 568—628 1 Claim

1. A process for the manufacture of 2-alkoxy-6-bromo-naphthalene having 1 or 2 carbons in the alkoxy group, which comprises brominating 1 mol of 2-hydroxy-naphthalene-1-carboxylic acid with 0.5 mol of bromine in sulfuric acid at about 5° to 30° C., heating the bromination mixture of 105°–120° C., isolating the formed and precipitated 6-bromo-2-hydroxy-

naphthalene and alkylating it with dimethylsulfate or diethylsulfate in aqueous medium.

4,137,273

PHENOLIC ETHERS

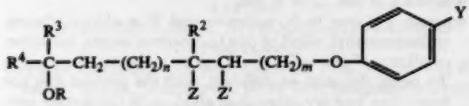
John B. Siddall, Palo Alto, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation of Ser. No. 100,787, Dec. 22, 1970, abandoned, which is a continuation-in-part of Ser. No. 59,762, Jul. 30, 1970, Pat. No. 3,709,914. This application Jan. 19, 1973, Ser. No. 324,903

Int. Cl.[2] C07C *43/20*

U.S. Cl. 568—648 **10 Claims**

1. A compound of the formula:



wherein,

Y is lower alkyl or lower alkoxy;

m is the positive integer one or two;

n is the positive integer two or three;

each of R^2, R^3 and R^4 is methyl or ethyl;

R is hydrogen, lower alkyl, cycloalkyl or aralkyl; and

each of Z and Z′ is hydrogen, or, taken together, a carbon carbon double bond.

4,137,274

PROCESS FOR MOTOR FUEL PRODUCTION BY OLEFIN POLYMERIZATION

Michael Z. Mikulicz, Palatine, and Vance P. Burton, Arlington Heights, both of Ill., assignors to UPO Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 588,105, Jun. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 475,686, Jun. 3, 1974, abandoned. This application Dec. 13, 1976, Ser. No. 750,348

Int. Cl.[2] C07C *3/16*

U.S. Cl. 260—683.15 C **4 Claims**

1. A process for the production of motor fuel which comprises the steps of:

(a) admixing into a feed stream comprising normally gaseous olefins about 0.5 to about 5.0 wt. %, based on the feed stream, of an aromatic hydrocarbon having a boiling point below 400° F.;

(b) contacting the resultant mixture with a polymerization catalyst in a reaction zone maintained at polymerization-promoting conditions including a pressure sufficient to maintain at least 50 vol. % of the added aromatic hydrocarbon in a liquid phase, effecting as the principal reaction in the process the polymerization of a large portion of the normally gaseous olefins to form polymers having boiling points within the range of 110° F. to 420° F., and also effecting the alkylation of a portion of the aromatic hydrocarbon with a smaller second portion of the normally gaseous olefins to form a high octane alkylated aromatic hydrocarbons;

(c) withdrawing an effluent stream from the reaction zone comprising the polymers, the aromatic hydrocarbon and the alkylated aromatic hydrocarbon; and,

(d) recovering from the effluent stream a motor fuel product comprising the polymers, the aromatic hydrocarbon and the alkylated aromatic hydrocarbon.

4,137,275

LATENT ACCELERATORS FOR CURING EPOXY RESINS

James D. B. Smith, Wilkins Township, Allegheny County, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 27, 1976, Ser. No. 680,633

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—830 TW **8 Claims**

1. A highly fluid, solventless, high voltage capability, insulating, resinous composition consisting essentially of (1) 100 parts by weight of an epoxy resin mixture consisting essentially of: a first epoxy resin consisting of a diglycidyl ether of an aliphatic diol and a second epoxy resin selected from the group consisting of bisphenol A epoxy resins, bisphenol F epoxy resins, novolac epoxy resins, glycidyl ester epoxy resins, hydantoin epoxy resins, cycloaliphatic epoxy resins and mixtures thereof, (2) about 25 parts to 200 parts by weight of an organic carboxylic acid anhydride and (3) 0.002 part to 1.00 part of chromium (III) acetylacetonate, acting as a latent catalyst, wherein the resinous composition has an initial viscosity of below about 350 cps. at 25° C.

4,137,276

FLEXIBLE FILM LAMINATING ADHESIVES

Julius Sirota, South Plainfield, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 19, 1977, Ser. No. 825,912

Int. Cl.[2] C08L *63/00*

U.S. Cl. 260—830 P **5 Claims**

1. A curable two-part laminating adhesive for flexible film comprising:

(a) an alcoholic solution of ketimine terminated and/or amine terminated polyetherurethane-urea prepared by the addition of at least 50% of the stoichiometric equivalent of a diketimine having —NH functionality of 0, 1 or 3 to an isocyanate terminated polyalkylene ether diol urethane prepolymer; and

(b) a polyepoxide in a chain-extending and cross-linking amount of about 10–30% by weight, based on the weight of said ketimine terminated and/or amine terminated polyetherurethane-urea solids.

4,137,277

POWDER PAINT WITH EPOXY AND AMIDE COPOLYMER WITH CARBOXY TERMINATED CROSSLINKING AGENT

John D. Nordstrom, Detroit, and Stephen C. Peng, Utica, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 394,875, Sep. 6, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,518

Int. Cl.[2] C08G *59/42*

U.S. Cl. 260—835 **4 Claims**

1. In a thermosettable powder paint which exclusive of pigments, catalysts, antistatic agents, plasticizers and flow control agents, the same being conventional non-reactive additive to a thermosettable powder paint, consists essentially of a coreactive particulate mixture of

(A) a copolymer consisting essentially of about 5 to about 20 weight percent of a glycidyl ester of a monoethylenically unsaturated carboxylic acid and about 80 to about 95 weight percent of other monoethylenically unsaturated monomers, and having a glass transition temperature in the range of about 40° C. to about 90° C. and a molecular weight ($\overline{M}_n$) in the range of about 1500 to about 15,000 and

(B) as crosslinking agent, a carboxy-terminated compound selected from the group consisting of carboxy-terminated epoxy esters and carboxy-terminated polyesters and having molecular weight in the range of about 650 to about 3000,

the improvement wherein said copolymer is qualitatively di-

functional and said other monoethylenically unsaturated monomers consist essentially of difunctional monomers selected from the group consisting of acrylamide and methacrylamide in an amount comprising about 2 to about 10 weight percent of said copolymer and monoethylenically unsaturated monomers consisting essentially of monofunctional monomers selected from the group consisting of esters of a C_1–C_8 monohydric alcohol and acrylic acid, esters of a C_1–C_8 monohydric alcohol and methacrylic acid and C_8–C_{12} monovinyl hydrocarbons.

4,137,278

MELT POLYMERIZATION PROCESS AND LINEAR AROMATIC POLYESTERS PREPARED THEREFROM

Anthony L. Lemper, Amherst, and Jerold C. Rosenfeld, Tonawanda, both of N.Y., assignors to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 542,635, Jan. 20, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,493

Int. Cl.² C08L *67/00*

U.S. Cl. 260—860 **18 Claims**

1. A melt polymerization process for the preparation of a linear aromatic polyester having an intrinsic viscosity of at least 0.5 dl/g when measured in sym-tetrachloroethane at 25° C. which comprises (a) mixing a diphenyl ester of terephthalic acid and a hydroxyl component comprising bisphenol A and an oligomer of terephthalic acid and a diol of 2 to 20 carbon atoms, said oligomer having a degree of polymerization of 1 to about 20; and (b) reacting the mixture in the presence of a transesterification catalyst at an elevated temperature; wherein the diphenyl ester component and said hydroxyl component are present in proportions from stoichiometric proportions to an excess of up to about 120 percent of stoichiometric proportion of either component; and where the weight ratio of bisphenol A to oligomer is from 95:5 to 15:85.

4,137,279

COPOLYMERS OF POLYCAPROLACTONE DERIVATIVES AND ETHYLENICALLY UNSATURATED MONOMERS

Oliver W. Smith, South Charleston, and Joseph V. Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 27, 1977, Ser. No. 864,754

Int. Cl.² C08L *67/06*

U.S. Cl. 260—861 **17 Claims**

1. A polymer comprising (A) from 10 to 97 weight percent of the reaction product mixture of a polycaprolactone polyol and maleic anhydride and (B) from 3 to 90 weight percent of an ethylenically unsaturated monomer polymerized with (A); wherein said reaction product mixture (A) is the adduct of a polycaprolactone polyol having at least two hydroxyl groups in the molecule, a hydroxyl number of from 4 to 600 and an average molecular weight of from 290 to 25,000 with from 0.1 to 1 anhydride equivalent per hydroxyl equivalent in said polyol initially charged.

4,137,280

POLYALKYLENE CARBONATES AS PROCESSING AIDS FOR POLYVINYL CHLORIDE

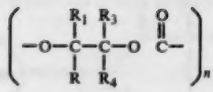
Dale D. Dixon, Kutztown, and Michael E. Ford, Trexlertown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 19, 1978, Ser. No. 897,627

Int. Cl.² C08L *69/00*

U.S. Cl. 260—873 **7 Claims**

1. A polymeric composition which comprises a uniform blend of a vinyl chloride polymer containing at least 50% vinyl chloride, and from about 5–60% by weight of said blend of a polyalkylene carbonate formed by reacting an alkylene oxide and carbon dioxide having a repeating unit of the formula:



wherein:

R_1 is a hydrogen atom or hydrocarbyl group having from 1–6 carbon atoms;

R_3 is hydrogen or hydrocarbyl having from 1–6 carbon atoms;

R_2 and R_4 are hydrogen or hydrocarbyl having from 1–6 carbon atoms; and

n is an interger from 250–6500.

4,137,281

IMPACT-RESISTANT, HIGH SOFTENING MALEIC ANHYDRIDE COPOLYMERS

George S. Li, Aurora, and Richard J. Jorkasky, II, Walton Hills, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Oct. 14, 1977, Ser. No. 842,019

Int. Cl.² C08F *279/02*

U.S. Cl. 260—878 R **10 Claims**

1. The resinous polymer composition resulting from the polymerization of 100 parts by weight of

(A) from 0 to 70% by weight of styrene,

(B) from 10 to 55% by weight of maleic anhydride, and

(C) from 5 to 50% by weight of a member selected from the group consisting of isobutylene, propylene, diisobutylene, dipropylene, triisobutylene, 2,3,3-trimethyl-butene-1; 2,4-dimethyl-pentene-1, and 2-methyl-butene-1 in the presence of from 1 to 40 parts by weight of

(D) a rubber selected from the group consisting of

(1) a rubbery polymer of from 50 to 100% by weight of at least one member selected from the group consisting of butadiene and isoprene and from 0 to 50% by weight of at least one member selected from the group consisting of an olefinic nitrile, an ester of an acrylic acid, and styrene,

(2) a homopolymer of an ester of an acrylic acid,

(3) chlorinated butyl rubber, and

(4) an ethylene-propylene rubber.

4,137,282

PROCESS FOR PRODUCING WATER-DISPERSIBLE FILM-FORMING MATERIAL

Yutaka Otsuki, Yokohama; Hideo Horii, Tokyo, and Yoshihiko Araki, Kawasaki, all of Japan, assignors to Nippon Oil Company, Ltd., Japan

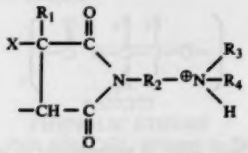
Filed Dec. 5, 1977, Ser. No. 858,457

Claims priority, application Japan, Dec. 10, 1976, 51-147668

Int. Cl.² C08F *279/06*

U.S. Cl. 260—879 **5 Claims**

1. A process for producing a film-forming material, which comprises graft-polymerizing in the absence of a surface active agent a monomer having a radical polymerizable ethylenically unsaturated group in the presence of a radical initiator with a butadiene polymer of a low degree of polymerization having a number average molecular weight of 300 to 10,000, a butadiene copolymer of a low degree of polymerization containing not more than 50% by weight of a copolymer component, or a mixture of these, in the form of an aqueous solution, said butadiene polymer or copolymer in aqueous solution or aqueous dispersion containing 0.05 to 0.5 mole, per 100 g of the polymer, of a basic group of the general formula



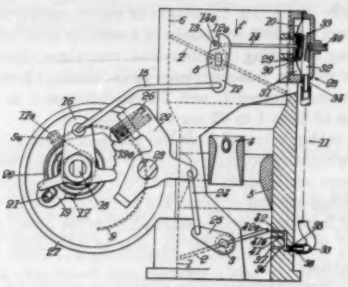
wherein R_1 represents a hydrogen atom, a halogen atom or an organic group containing 1 to 8 carbon atoms; R_2 and R_3 are identical or different and represent an organic group containing 1 to 20 carbon atoms; R_4 represents a hydrogen atom or an organic group containing 1 to 20 carbon atoms; and X represents a hydrogen atom or a bond, and when X is a bond, the carbon atom attached to R_1 and the adjacent carbon atom to which hydrogen is attached may form a part of the main chain.

4,137,283

STARTING FACILITIES FOR INTERNAL COMBUSTION ENGINE CABURETORS

Jean-François Couderc, Bouffemont, France, assignor to Societe Industrielle de Brevets et d'Etudes, S.I.B.E., Neuilly-sur-Seine, France

Continuation of Ser. No. 580,242, May 23, 1975, abandoned.
This application Dec. 9, 1976, Ser. No. 749,059
Claims priority, application France, May 27, 1974, 74 18298
Int. Cl.[2] F02M *1/12*
U.S. Cl. 261—39 B **6 Claims**



1. A carburetor for an internal combustion engine, said carburetor comprising:

an intake pipe;

a main operator-controlled throttle element in said intake pipe;

a main fuel jet system;

a choke valve in said intake pipe upstream of said throttle element, said choke valve being biased toward opening by air flow in said intake pipe;

a thermostat element comprising a bimetallic coil subjected to the temperature of the engine;

a rotary lever;

a one-way connection linkage;

one end of said bimetallic coil being fixed and the other end thereof being connected to said choke valve through said rotary lever and said one-way connection linkage;

a pneumatic element having a one-way connection with said choke valve, said pneumatic element being constructed to override said thermostat element when energized to open said choke valve by a predetermined amount;

auxiliary means comprising a spindle means secured to said lever;

a fast idle cam rotatably mounted on said spindle means;

a separate thermostatic means subjected to ambient temperature and connecting said cam and said spindle means;

said thermostat element and auxiliary means being constructed to move said fast idle cam to a position corresponding to a first minimum opening position when the temperature of the engine increases and the ambient temperature increases and for moving the fast idle cam to a position corresponding to a second minimum opening position of said main throttle element, in which the main throttle element is more open than in said first position, when the engine temperature and ambient temperature are at the value corresponding to the minimum starting temperature of the engine; and

duct means fluidly communicating said pneumatic element and said intake pipe, said duct means having a calibrated restriction therein, said duct means opening into said intake pipe at

a first fixed position which is downstream of the main throttle element during all operating conditions of the engine, and

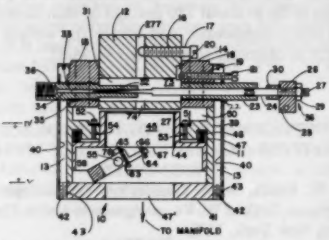
a second fixed position which is upstream of the main throttle valve when it is in said first minimum opening position and is downstream of the main throttle valve when it is in said second minimum opening position.

4,137,284

CARBURETOR

Boyd D. Barbee, 1941 63rd Ave., Sacramento, Calif. 95823

Filed Aug. 18, 1977, Ser. No. 825,621
Int. Cl.[2] F02M *9/12*
U.S. Cl. 261—44 B **18 Claims**



1. A carburetor for controlling the mixture of fuel and air entering the carburetor and atomizing the same including;

a housing;

a fuel inlet leading into said housing;

a seal block having an air inlet mounted in said housing;

said housing having a head portion surrounding said seal block;

a movable valve in said housing below said seal block having a throat in fluid communication with said air inlet;

an air inlet in said housing surrounding said block in fluid communication with a chamber formed in said housing below said block and surrounding said valve;

a plurality of restricted orifices in said valve in fluid communication with both said throat and said chamber;

adjusting means engaging said fuel inlet for selectively adjusting the ratio of fuel to air in the mixture of fuel and air entering said housing by varying the amount of fuel entering said housing,

valve lifting means coupled to said adjusting means and operatively engaging said valve for selectively lifting the same;

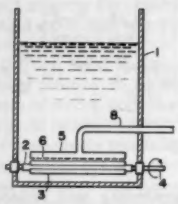
seal block positioning means engaging said seal block for adjusting the position of said seal block with respect to said valve to thereby selectively seal said block against the upper surface of said valve; and

an outlet in said housing below said throat in fluid communication therewith.

4,137,285
GAS-LIQUID CONTACT APPARATUS

Michihiko Nojiri, Takaishi; Tatsuo Watanabe, Fujiidera, and Kazuyoshi Matsuo, Sakai, all of Japan, assignors to Mitsui Engineering & Shipbuilding Co., Ltd., Tokyo, Japan

Filed Jun. 7, 1977, Ser. No. 804,443
Claims priority, application Japan, Jun. 24, 1976, 51/74887; Sep. 27, 1976, 51/115559
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—93 7 Claims

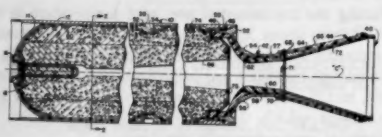


1. A gas-liquid contact apparatus, comprising:
a vessel for holding the liquid and maintaining a fixed liquid level;
pipe means stationarily mounted within said vessel being provided with a plurality of apertures arranged along a fixed path below the liquid level;
gas supply means extending through said vessel for conducting pressurized gas to said pipe means to eject the gas through said apertures into the liquid;
rotor means including a shaft mounted for rotation about a fixed axis within said vessel below the liquid level, and power transmission means extending through said vessel and being drivingly connected to said shaft for rotating said shaft about its axis;
said rotor means further including a plurality of blades mounted on said shaft to be spaced about the periphery of said shaft and extend generally radially, outward from said shaft axis, and said blades being provided with radially outermost surfaces, so that with rotation of said shaft, said outermost surfaces pass closely adjacent said fixed path of apertures.
and said rotor means shearing gas bubbles from the gas being ejected through said apertures;
the path of said apertures being in a straight line parallel to and spaced from said shaft axis;
said apertures extending downwardly away from said pipe means so as to eject the gas downwardly with respect to said vessel.

4,137,286
METHOD OF MAKING DUAL-THRUST ROCKET MOTOR

Lawrence J. Bornstein, Sacramento, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Aug. 12, 1960, Ser. No. 49,390
Int. Cl.[2] C06B *21/00*
U.S. Cl. 264—3 R 9 Claims



1. A method of making a dual-thrust rocket motor comprising: filling a rocket motor housing with a first propellant grain material, forcing a cured second solid propellant grain centrally within the first propellant grain material and substantially to the bottom thereof, curing the first propellant grain with the second solid propellant grain held in place, and attaching an igniter means and nozzle means to the housing.

4,137,287
METHOD OF PREPARING BETA ALKALINE ALUMINA PARTS

Gérard Desplanches, Villejust; Yvon Lazennec, St. Michel sur Orge, and Jacques Leboucq, Ste. Genevieve des Bois, all of France, assignors to Compagnie Generale d'Electricite S.A., Paris, France

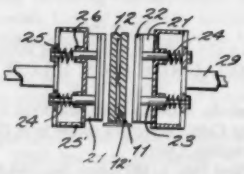
Filed Nov. 11, 1976, Ser. No. 741,081
Claims priority, application France, Nov. 26, 1975, 75 36169
Int. Cl.[2] C04B *35/10*
U.S. Cl. 264—62 12 Claims

1. A method of preparing beta alkaline alumina parts which comprises the following successive stages:
A. intimately mixing alumina and alkaline carbonate powders in quantities such that a predetermined ratio of alumina to alkaline carbonate is obtained;
B. heating said initiate mixture in an open crucible;
C. cooling said mixture freely;
D. crushing the powder thus obtained;
E. forming said parts; and
F. sintering the parts;
the improvement wherein after said forming and before sintering, depositing a layer of a compound of said alkaline metal on the surface of the parts in contact with the atmosphere;
whereby, an atmosphere rich in alkaline metal is created in the immediate vicinity of the parts during sintering for compensating any loss of alkaline metal which may occur from the parts while minimizing alkaline metal losses by diffusion of the alkaline metal towards the outside of the parts.

4,137,288
APPARATUS FOR THE PRODUCTION OF CERAMIC PLATES WITH ORNAMENTAL SHAPES

Hans Lingl, Neu-Ulm-Ludwigsfeld, Fed. Rep. of Germany, assignor to Lingl Corporation, Paris, Tenn.

Continuation of Ser. No. 478,036, Jun. 10, 1974, abandoned.
This application Dec. 10, 1975, Ser. No. 639,346
Claims priority, application Fed. Rep. of Germany, Aug. 17, 1973, 2341631
Int. Cl.[2] B28B *11/16*
U.S. Cl. 264—67 7 Claims



1. A method for producing ornamentally shaped tiles comprising the steps of
(a) forming a continuous clay column in an extrusion press, said column having a pair of side faces and a groove in the middle of said column throughout the length thereof substantially equally spaced from said side faces,
(b) conveying said column from said extrusion press to a tile forming assembly,
(c) punching ornamentally shaped tile imprints into said side faces of said column in a direction perpendicular to the direction of movement of said columm and forcing each said tool through said column face to approximately said groove in the middle of said column so that ornamentally shaped tiles are formed,

(d) moving said punching tool with the same velocity as said column during punching so that there is no relative movement in the direction of movement of said column between said punching tool and said column while said punching tool acts upon said column,

(e) severing a section of said column acted upon by said punching tools from the rest of the column at an area not coterminus with a tile edge formed by punching the tile from the column, whereby severed column sections are formed, and

(f) severing said formed column sections along said groove therein extending the length of said sections.

4,137,289

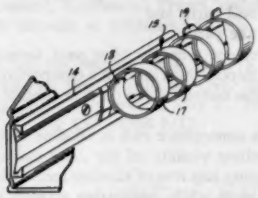
METHOD OF MAKING A SPIRAL BINDER

Henry N. Staats, Deerfield, Ill., assignor to General Binding Corporation, North Brook, Ill.

Division of Ser. No. 808,556, Jun. 21, 1977. This application Apr. 11, 1978, Ser. No. 895,394

Int. Cl.[2] B29C *17/02, 17/10*

U.S. Cl. 264—138 **3 Claims**



1. A method for constructing a removable binding slidably engageable in a channel member mounted to a cover, comprising:

providing a single sheet of plastic material;

cutting a pattern for the removable binding from the single sheet having a strip-like base portion, parallel finger-like strips extending at right angles to the longitudinal axis of the base portion, a projecting first tab between each of the finger-like strips, and a projecting second tab opposite each first tab projecting from an edge of the base portion;

curling the pattern to curve the base portion and form said finger-like strips into loops; and

bending the first and second tabs away from the direction of curve of the base portion such that the first and second tabs all lie approximately in the same plane.

4,137,290

METHOD AND APPARATUS FOR RECOVERY OF HEAVY METAL IONS FROM DILUTE AQUEOUS SOLUTION

David J. Degenkolb, Mission Hills, and Fred J. Scobey, Hollywood, both of Calif., assignors to De luxe General, Incorporated, Los Angeles, Calif.

Filed Feb. 1, 1977, Ser. No. 764,669

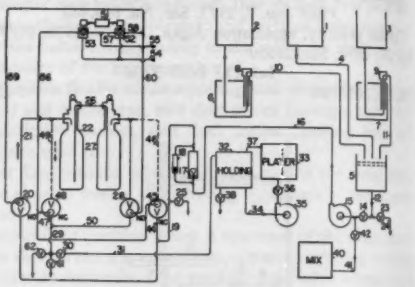
Int. Cl.[2] B01D *15/04;* **C01G** *1/00*

U.S. Cl. 423—1 **2 Claims**

1. The method of recovery of a heavy metal ion from a dilute photographic processing solution having a concentration within the range of 3 to 50 parts per million by ion exchange, said solution also containing gelatinous contaminants which pack resinous particles that includes the method steps of;

(a) flowing said solution downward under pressure in an enclosed vessel through a bed of resinous ion-absorbing material for an interval of time of approximately an hour,

(b) subsequently reversing the flow and flowing further said solution upward under pressure through the same said bed of ion-absorbing material, at a discharge velocity into said material of not more than one-half of the resin volume of the solution per minute, to physically agitate said bed of ion-absorbing material and to expand the volume that it occupies and dislodge said gelatinous contaminants for a further interval of time of approximately an hour, and



(c) periodically regenerating said resinous ion-absorbing material to effect a continuing process.

4,137,291

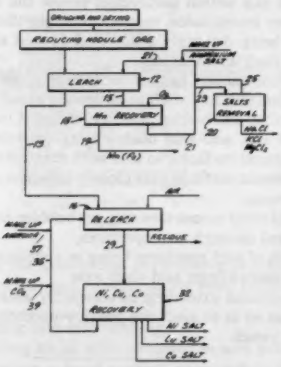
EXTRACTION OF METAL VALUES FROM MANGANESE NODULES

Paul H. Cardwell, Zanoni, and William S. Kane, Wicomico, both of Va., assignors to Deepsea Ventures, Inc., Gloucester, Del.

Filed Oct. 18, 1976, Ser. No. 733,214

Int. Cl.[2] C01G *3/14, 51/12, 53/12*

U.S. Cl. 423—24 **16 Claims**



1. A process for selectively removing metal values from a manganese nodule ore, the ore comprising a primary proportion of manganese and iron and secondary proportions of nickel, copper and cobalt, the weight ratio of manganese : iron being at least about 5:1 and the total combined amounts of copper and nickel being at least abour 1.5% by weight of the nodule ore, the process comprising:

(a) comminuting the ore to a particle size of not greater than about 20 mesh;

(b) reducing the comminuted ore, at a temperature in the range of from about 300 to about 850° C., in the presence of a reducing agent selected from the group consisting of carbonaceous materials and hydrogen, such that the manganese, nickel, cobalt and copper values are reduced to a condition in which the metal values are leachable by ammoniacal ammonium salt solutions;

(c) leaching the reduced ore with an aqueous leaching solution of an acidic ammonium salt, the ammonium salt being present in an amount in the range of from about 80% to about 120% by weight of the stoichiometric amount to react with all of the manganese value in the ore, so as to

obtain an aqueous pregnant leach solution comprising dissolved manganese salt and a first solid residue comprising the remaining nickel, copper and cobalt salts;

(d) oxygenating the pregnant leach solution to form an oxidic precipitate comprising the manganese and any iron values present in the pregnant leach solution; and separating the oxidic precipitate from the aqueous solution to regenerate the aqueous leaching solution of an acidic ammonium salt substantially free of dissolved manganese and iron;

(e) ammoniating the regenerated aqueous leaching solution to form an ammoniacal basic releaching solution of the ammonium salt wherein the concentration of ammonia is at least about 0.5 molar and wherein the concentration of the ammonium salt is at least about 0.2 Normal; and

(f) releaching the first solid residue with the ammoniacal basic releaching solution to form an aqueous pregnant releach solution of nickel, copper and cobalt soluble salts and a second solid residue.

3. A process for selectively removing metal values from a manganese nodule ore, the ore comprising a primary proportion of manganese and iron and secondary proportions of nickel, copper and cobalt, the weight ratio of manganese: iron being at least about 5:1 and the total combined amounts of copper and nickel being at least about 1.5% by weight of the nodule ore, the process comprising:

(a) comminuting the ore to a particle size of not greater than about 20 mesh;

(b) reducing the comminuted ore, at a temperature in the range of from about 300 to about 850° C., in the presence of a reducing agent selected from the group consisting of carbonaceous materials and hydrogen, such that the manganese, nickel, cobalt and copper values are reduced to a condition in which the metal values are leachable by ammoniacal ammonium salt solutions;

(c) leaching the reduced ore with an aqueous leaching solution of an acidic ammonium salt, the ammonium salt being present in an amount in the range of from about 80% to about 120% by weight of the stoichiometric amount to react with all of the manganese value in the ore, so as to obtain an aqueous pregnant leach solution comprising dissolved ammonia and manganese salt, without the evolution of substantial quantities of free ammonia, and a first solid residue comprising the remaining nickel, copper and cobalt salts;

(d) oxygenating, without adding other reagent to, the pregnant leach solution to form an oxidic precipitate comprising the manganese, and any iron, values present in the pregnant leach solution to regenerate the aqueous leaching solution of an acidic ammonium salt substantially free of dissolved manganese and iron and separating the oxidic precipitate from the regenerated aqueous leaching;

(e) recycling the regenerated aqueous leaching solution to leach additional reduced and comminuted ore; and

(f) releaching the first solid residue with an ammoniacal basic releaching solution of an ammonium salt wherein the concentration of ammonia is at least about 0.5 molar and wherein the concentration of the ammonium salt is at least about 0.25 Normal to form an aqueous pregnant releach solution of nickel, copper and cobalt soluble salts and a second solid residue.

4,137,292

PURIFICATION OF TITANIUM TRICHLORIDE

William K. Tolley, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 2, 1978, Ser. No. 882,845

Int. Cl.[2] C01G *23/02, 23/04*

U.S. Cl. 423—75 **1 Claim**

1. A process for purifying titanium trichloride and recovering titanium dioxide and titanium tetrachloride which comprises the steps of:

(a) drying said titanium trichloride in an air atmosphere at a temperature below about 100° C.;

(b) further drying said titanium trichloride in a carbon monoxide atmosphere at an elevated temperature in the range of from about 250° to about 750° C.;

(c) roasting the dried titanium trichloride for about 0.5 to about 2 hours at an elevated temperature in the range of from about 400° to about 750° C. in the presence of carbon monoxide and chlorine;

(d) separating the volatile impurities; and

(e) recovering purified titanium dioxide and titanium tetrachloride.

4,137,293

PRODUCING GYPSUM AND MAGNETITE FROM FERROUS SULFATE AND SEPARATING

Koichi Nagata, Yokkaichi; Kokichi Miyazawa, Suzuka; Takeshi Sato; Masashi Tsuchimoto, both of Yokkaichi, and Junichi Kawashima, Koka, all of Japan, assignors to Ishihara Sangyo Kaisha, Ltd., Osaka, Japan

Filed Dec. 16, 1977, Ser. No. 862,438

Int. Cl.[2] C01F *11/46;* C01G *49/08*

U.S. Cl. 423—140 **5 Claims**

1. A process for producing gypsum and magnetite which comprises introducing a calcium reagent into an aqueous solution containing ferrous sulfate while an oxidizing gas is blown thereinto and then separating and recovering the resulting gypsum and magnetite separately, characterized by using calcium carbonate as the calcium reagent, carrying out an oxidizing and neutralizing operation at a pH of 5–6 and a temperature of 60°–80° C., and carrying out separation of gypsum and magnetite by magnetic separation.

4,137,294

PROCESS OF SCRUBBING FUEL SYNTHESIS GASES TO REMOVE ACID GASES AND ORGANIC SULFUR COMPOUNDS

Karl Braizler, Bad Homburg von der Hohe, and Alexander Doerges, Oberursel, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 881,390, Dec. 2, 1969, abandoned. This application Apr. 8, 1976, Ser. No. 674,992

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1968, 1815137

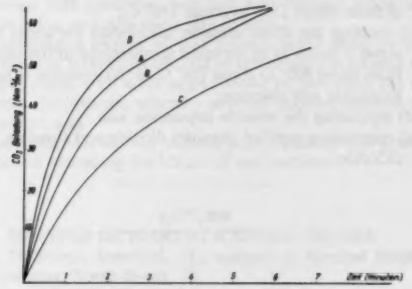
The portion of the term of this patent subsequent to Jun. 30, 1993, has been disclaimed.

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—223 **5 Claims**

1. In a process for scrubbing fuel and synthesis gases to remove hydrogen sulfide, carbon dioxide and organic sulfur compounds therefrom wherein the gas to be treated to produce substantially pure gas is passed through an absorption zone at a superatmospheric pressure and at a temperature of above 0° C. up to 100° C. and then through a scrubbing zone to recover entrained absorbent, the absorption zone being supplied with a circulating absorbent comprising a primary aliphatic alcohol, one or more alkanolamines and eventually water, whereafter the absorbent is regenerated by flashing and heating, the improvement which comprises washing the gases in the absorption zone using an absorbent consisting essentially of methanol

and 0.2 to 4 moles of an alkanolamine per liter of absorbent, flashing the rich absorbent and heating it to a boiling tempera-



ture not higher than 100° C., cooling the absorbent and recirculating it to the absorption zone.

4,137,295

CARBIDE PRODUCTION USING MOLTEN METALS AS HEAT SOURCE

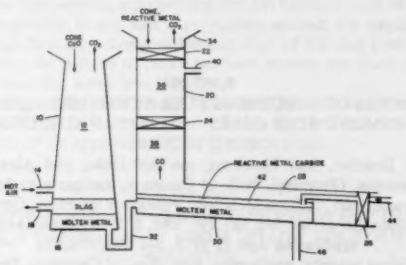
Murry A. Tamers, Nova University, Ft. Lauderdale, Fla. 33314

Filed Apr. 20, 1977, Ser. No. 789,075

The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.

Int. Cl.[2] C01B *31/30, 31/32*

U.S. Cl. 423—439 **7 Claims**



1. A process for producing carbides of reactive metals comprising:

(a) forming, in a first reaction zone, a molten metal selected from the group consisting of iron and copper by combustion of a fuel,

(b) passing the molten metal from the first reaction zone to a second reaction zone,

(c) supplying to said second zone a reactive metal source selected from the group consisting of alkali metals and alkaline earth metals and the carbonates, oxides and hydroxides thereof and a carboneaceous fuel wherein the sensible heat of the molten metal supplies the heat required to react said reactive metal source with said fuel to form a carbide of the reactive metal, which floats on the surface of the molten metal and

(d) separating the metal carbide and the molten metal.

4,137,296

PRODUCTION OF CHLORINE DIOXIDE

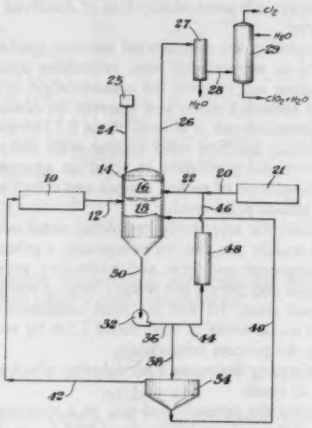
David N. Glew, and E. Colin W. Clarke, both of Sarnia, Canada, assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 2, 1976, Ser. No. 737,885

Claims priority, application Canada, Oct. 26, 1976, 264159

Int. Cl.[2] C01B *11/02*

U.S. Cl. 423—478 **28 Claims**



23. A method to produce chlorine dioxide from an alkali metal chlorate by reacting the chlorate with HCl comprising maintaining in a reaction vessel an aqueous reaction medium containing at least 5.5 moles per liter of sodium chlorate and substantially entirely saturated with sodium chlorate, sufficient HCl to provide an acid normality of at least about 0.002 and sufficient sodium chloride to saturate the reaction medium; boiling the reaction medium at a temperature of from about 40° to about 100° C.; and withdrawing a mixture including chlorine dioxide gas, chlorine gas and a water vapor from the reaction vessel.

4,137,297

PROCESS FOR THE PRODUCTION OF TITANIUM DISULPHIDE

Anthony J. Thorp, Immingham; Frank Clamp, Grimsby; Raoul Feld, Cleethorpes; Joseph E. Page-Gibson, Grimsby, and Keith Archer, Brigg, all of England, assignors to Laporte Industries Limited, Great Britain

Filed Dec. 1, 1977, Ser. No. 856,605

Int. Cl.[2] C01G *23/00*; C01B *7/08*

U.S. Cl. 423—561 R **16 Claims**

1. A process for the production of titanium disulphide, which comprises; forming a dry, oxygen-free, hydrogen-free reactant gas mixture having a mixed gas temperature, of from 460° C. to 570° C. by mixing preheated titanium tetrachloride and hydrogen sulfide streams and comprising an inert gas, titanium tetrachloride and hydrogen sulphide, the hydrogen sulphide being in an excess over the stoichiometric quantity for reaction with the titanium tetrachloride, and the titanium tetrachloride and the hydrogen sulphide streams, both containing inert gas being separately preheated to temperatures within 50° C. of each other, the hydrogen sulphide not being preheated to above 600° C. nor using a heat source above 650° C.; passing the reactant gas mixture through a reaction zone as a gas stream having a velocity sufficient to entrain particles of titanium disulphide formed in the course of the reaction, heating the gas stream in the reaction zone by means of a heat source having a temperature less than 50° C. above the mixed gas temperature, removing the entrained titanium disulphide particles from the reaction zone and recovering the titanium disulphide particles from the entraining gases said particles having

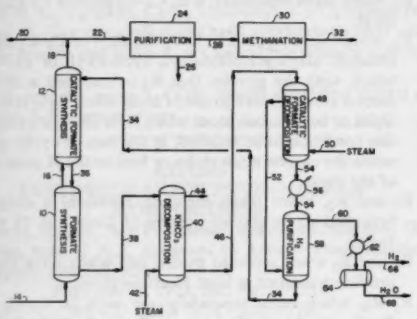
the composition Ti_xS_2, where x has a value from 1.00 to 1.02, and a particle size range of 1–25 microns.

4,137,298

PRODUCTION OF A HYDROGEN-RICH GAS FROM A HYDROGEN, CARBON MONOXIDE AND CARBON DIOXIDE-CONTAINING FUEL GAS

Clyde W. Zielke, Bethel Park, Pa., and Everett Gorin, San Rafael, Calif., assignors to Continental Oil Company, Stamford, Conn.

Filed Dec. 21, 1977, Ser. No. 863,025
Int. Cl.² C01B 1/18
U.S. Cl. 423—648 R **8 Claims**



1. In a process for the production of a hydrogen-rich gas from a fuel gas containing hydrogen, carbon monoxide, carbon dioxide and nitrogen or methane or both, said process consisting essentially of:

(a) contacting said fuel gas with an aqueous absorbing solution which contains at least one compound selected from the group consisting of sodium carbonate, sodium bicarbonate, potassium carbonate, potassium bicarbonate and mixtures thereof in a non-catalytic reaction zone under formate synthesis conditions of a temperature in the range of about 400° to about 600° F. and a pressure in the range of 20 to 150 atmospheres, whereby carbon monoxide is reacted with said compound to produce an aqueous solution which contains principally formate, and thereafter

(b) heating the aqueous formate-containing solution produced in step (a) in contact with a catalyst composite containing at least one metallic component selected from Group VI and Group VIII metals, their oxides and sulfides supported on an alkali resistant carrier at formate decomposition conditions of temperature in the range of 350°–600° F. and a pressure in the range of 20–200 atmospheres, whereby the formate in the aqueous formate-containing solution decomposes to produce a hydrogen-rich gas while regenerating said aqueous absorbing solution, and thereafter passing said aqueous absorbing solution to step (a), the improvement comprising countercurrently contacting said fuel gas from step (a) from which CO has been removed with fresh aqueous absorbing solution in a catalytic reaction zone with a catalyst composite comprising at least one metallic component selected from Group VI metals, their oxides and sulfides supported on an alkali-resistant carrier under formate synthesis conditions of a temperature in the range of about 350° to about 600° F. and a pressure in the range of about 20 to about 150 atmospheres whereby hydrogen and carbon dioxide are reacted with said compound to produce formate, and passing the resultant aqueous absorbing solution containing formate to step (a) to produce said formate-containing solution for decomposition in step (b).

4,137,299

BIOLOGICAL STAINING COMPOSITION AND STAINING METHOD

Joseph P. DiMaggio, Jr., 283 E. Main St., Bergenfield, N.J. 07621

Filed Apr. 21, 1975, Ser. No. 570,020
Int. Cl.² D06P 1/00; G01N 1/30, 33/16
U.S. Cl. 424—3 **7 Claims**

1. A stain composition for use in staining biological samples which comprises a mixture of a first component comprising Wright's stain solution prepared from Wright's stain powder in solution in absolute, acetone-free methyl alcohol in the ratio of 3 grams of said powder per liter of said methyl alcohol, and a second component comprising a 30% solution of a non-ionic surfactant comprising a polyethylene oxide (23) lauryl ether, said second component present in an amount up to about one percent by volume of said first component.

3. In the method of staining a biological sample which comprises applying to said sample a stain composition comprising Wright's stain in solution in methyl alcohol, permitting said stain composition to remain in contact with said samples for a time sufficient to enable said sample to become stained thereby, thereafter applying an equal quantity of a buffer solution comprising an aqueous solution of a phosphate salt, and maintaining said buffer solution in contact with said samples for from four to six minutes, and rinsing said sample and drying said sample under ambient conditions, the improvement wherein said stain composition and said buffer solution each respectively contain up to about one percent by volume of a 30% solution of a non-ionic surfactant comprising a polyethylene oxide (23) lauryl ether.

4,137,300

SUSTAINED ACTION DOSAGE FORMS

Pravin Sheth, Springfield, and Lewis J. Leeson, Roseland, both of N.J., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 716,314, Aug. 20, 1976, abandoned. This application Jun. 14, 1977, Ser. No. 806,424
Int. Cl.² A61K 9/24, 9/38, 9/42
U.S. Cl. 424—21 **13 Claims**

1. A sustained action dosage form of the type comprising at least (a) a core-mixture of a pharmacologically effective substance and at least two members selected from a higher alkanol and alkanoic acid melting above 25° C., and (b) an outer layer of a prolamine, wherein the proportions of said effective substance: said alkanol/acid: said prolamine vary from about 100:5:3 to about 100:200:80.

4,137,301

METHOD OF INHIBITING SKIN IRRITATION

Sharon G. Willer, Loveland; Paul R. Yust, and Ralph Kelly, both of Cincinnati, all of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Division of Ser. No. 319,030, Dec. 27, 1972, Pat. No. 4,076,799. This application Jan. 20, 1978, Ser. No. 871,009
Int. Cl.² A61L 9/04; A61K 31/74, 31/08
U.S. Cl. 424—45 **12 Claims**

1. A method for preventing or reducing irritation of the skin caused by contact with a skin irritating allergenic agent which comprises applying to the skin of a subject sensitized to said allergenic agent, prior to contact with said skin irritating allergenic agent, a protective agent containing at least two polar groups separated by a chain of at least 15 atoms, the majority of which are carbon atoms; wherein said protective agent is a condensation product of ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol, having the general formula

$$HO(CH_2CH_2O)_a(\underset{\displaystyle CH_3}{\underset{|}{CH}}CH_2O)_b(CH_2CH_2O)_cH$$

wherein
a is 1 to 150;
b is 15 to 70; and
c is 1 to 150.

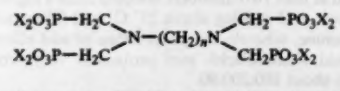
4,137,302
COSMETIC COMPOSITION
Françoise Humbert, and Micheline Davot, both of Paris, France, assignors to Lever Brothers Company, New York, N.Y.
Filed Mar. 23, 1977, Ser. No. 780,378
Claims priority, application United Kingdom, Apr. 2, 1976, 13433/76
Int. Cl.[2] A61K *7/00, 7/22, 7/42, 7/025*
U.S. Cl. 424—47 **2 Claims**

1. A composition for the topical treatment of living human skin which comprises from about 1% to about 20% by weight of mono acetyl urea together with an amount of N-methyl glucamine as a cosmetically acceptable vehicle sufficient to solubilize the mono acetyl urea.

2. A method for moisturizing living human skin which comprises applying to the skin a moisturizing amount of the composition as defined in claim 1.

4,137,303
ANTIBACTERIAL ORAL COMPOSITION
Abdul Gaffar, and Anthony R. Volpe, both of Somerset, N.J., assignors to Colgate Palmolive Company, New York, N.Y.
Continuation-in-part of Ser. No. 588,094, Jun. 18, 1975, abandoned. This application Jun. 3, 1977, Ser. No. 803,084
Int. Cl.[2] A61K *7/16, 7/18, 7/22*
U.S. Cl. 424—52 **23 Claims**

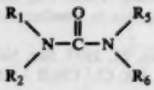
1. An oral composition comprising an oral vehicle, a quaternary ammonium antibacterial antiplaque agent tending to cause staining of dental surfaces and antibacterial agent being present in amount which provides about 0.001% to about 15% by weight based on the free base form thereof and an amount of at least about 0.01% by weight of a water soluble polyamine polyphosphonic compound stain reducing agent, which amount of at least about 0.01% by weight is such that upon ingestion an adverse effect does not occur, said polyamine polyphosphonic having the formula:



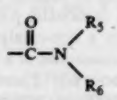
wherein n is a number from 1 to 10 and X is selected from the group consisting of hydrogen and an orally acceptable cation and said polyamine polyphosphonic compound reduces stain formed by said antibacterial antiplaque agent.

4,137,304
CYCLIC SUBSTITUTED UREAS HAVING A PHYSIOLOGICAL COOLING EFFECT
David G. Rowsell, Staines, and Roger Hems, Maidenhead, both of England, assignors to Wilkinson Sword Limited, London, England
Division of Ser. No. 568,663, Apr. 16, 1975, Pat. No. 4,044,120. This application Jun. 2, 1977, Ser. No. 802,369
Int. Cl.[2] A61K *7/22*
U.S. Cl. 424—54 **9 Claims**

1. In a manufactured consumer product for application to or consumption by the human body and being:
a. a personal care product comprising a topically or orally administrable base medium containing a flavourant, colourant, perfume, surface active agent or antiseptic agent;
b. an ingestible preparation comprising an edible or potable base containing a flavourant or colourant;
c. a pharmaceutical preparation comprising a topically or orally administrable pharmaceutically acceptable carrier and an active pharmaceutical ingredient; or
d. a tobacco containing consumer product,
said consumer product also containing an ingredient capable of stimulating the cold receptors of the nervous system of the surface tissues of the body when brought into contact therewith by application or consumption of the said product, the improvement which comprises using as said cold receptor stimulating ingredient an effective amount of a heterocyclic urea of the formula:



wherein
R_1, when taken separately, is H, C_1–C_7 alkyl or C_3–C_6 cycloalkyl;
R_2, when taken separately, is C_3–C_8 alkyl or C_3–C_8 alkylcycloalkyl, alkylcycloalkylalkyl, cycloalkyl, or cycloalkylalkyl, with the proviso that R_2 is branched at an alpha carbon atom relative to the N atom when R_1 is H or at an alpha or beta carbon atom when R_1 is alkyl or cycloalkyl, this condition to be satisfied, in the case of cyclic groups, when the carbon atom alpha or beta to the N atom is part of the cycle;
R_1 and R_2, when taken together, represent a straight or branched chain alkylene group of from 5 to 10 carbon atoms;
R_1 and R_2 when separate groups and when taken together provide a total of at least 5 carbon atoms;
R_5 R_6, when taken separately, are each H, C_1–C_6 alkyl, C_3–C_6 alkylcycloalkyl, cycloalkyl, or cycloalkylalkyl, C_2–C_8 hydroxyalkyl, C_2–C_8 carboxyalkyl or C_3–C_8 alkylcarboxy alky; or together represent a straight or branched chain C_3–C_{10} alkylene group optionally containing an ether oxygen atom; it being provided that at least one of the pairs R_1, R_2 and R_5, R_6, is joined in the manner defined to form at least one heterocycle, and R_1, R_2 and the group

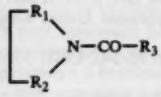


jointly provide a total of 7–16 carbon atoms.

4,137,305
CYCLIC AMIDES HAVING A PHYSIOLOGICAL COOLING EFFECT
David G. Rowsell, Staines, and Roger Hems, Maidenhead, both of England, assignors to Wilkinson Sword Limited, London, England
Division of Ser. No. 568,663, Apr. 16, 1975, Pat. No. 4,044,120. This application Jun. 2, 1977, Ser. No. 802,370
Claims priority, application United Kingdom, Apr. 17, 1974, 16803/74
Int. Cl.[2] A61K *7/22*
U.S. Cl. 424—54 **11 Claims**

1. In a manufactured consumer product for application to or consumption by the human body and being:
a. a personal care product comprising a topically or orally administrable base medium containing a flavourant, colourant, perfume, surface active agent or antiseptic agent;
b. an ingestible preparation comprising an edible or potable base containing a flavourant or colourant;
c. a pharmaceutical preparation comprising a topically or orally administrable pharmaceutically acceptable carrier and an active pharmaceutical ingredient; or
d. a tobacco containing consumer product,
said consumer product also containing an ingredient capable of stimulating the cold receptors of the nervous system of the

surface tissues of the body when brought into contact therewith by application or consumption of the said product, the improvement which comprises using as said cold receptor stimulating ingredient an effective amount of an amide of the formula:



wherein

R_1 and R_2 jointly represent a straight or branched chain alkylene group of 5–10 carbon atoms;

R_3 is H, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, C_2–C_8 hydroxyalkyl, C_2–C_8 carboxyalkyl or C_3–C_8 alkylcarboxyalkyl with the proviso that when R_3 is C_6 alkyl it is primary in structure;

R_1, R_2 and the group —COR_3 jointly providing a total of from 7–16 carbon atoms.

4,137,306
ANHYDROUS ANTIPERSPIRANT STICK COMPOSITIONS

Andrew M. Rubino, New Providence, and John J. Margres, Old Bridge, both of N.J., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Jun. 5, 1973, Ser. No. 367,310
Int. Cl.² A61K *7/34, 7/36, 7/38*
U.S. Cl. 424—68 **15 Claims**

1. A stable astringent composition in stick form comprising a substantially anhydrous, homogeneous mixture of about 5 to 20 weight percent of an alcohol soluble astringent basic aluminum compound, about 20 to 35 weight percent of an alkylene polyhydric alcohol, about 20 to 30 weight percent of a normally solid higher fatty acid amide of an alkylolamine in which the fatty acid radical contains at least 12 carbon atoms and the alkylol groups of said alkylolamine contain from 2 to 3 carbon atoms, and about 1 to 40 weight percent of a non-toxic dermatologically acceptable non-aqueous solvent for said astringent basic aluminum compound, said weight percents being based on the total weight of the mixture, and said mixture being in stick form suitable for application to the human axilla.

4,137,307
PROCESS FOR PREPARING HAPTOGLOBIN AQUEOUS SOLUTION USING STRONG ANION EXCHANGER

Satoshi Funakoshi, Katano; Takao Omura, Toyonaka, and Takeshi Ohshiro, Osaka, all of Japan, assignors to The Green Cross Corporation, Osaka, Japan

Division of Ser. No. 677,085, Apr. 15, 1976, Pat. No. 4,061,735, and a continuation-in-part of Ser. No. 444,662, Feb. 21, 1974, abandoned. This application Apr. 19, 1977, Ser. No. 788,921
Claims priority, application Japan, Nov. 15, 1973, 48-128605; Nov. 15, 1973, 48-128606
Int. Cl.² A61K *37/04, 37/06;* **C07G** *7/00*
U.S. Cl. 424—177 **17 Claims**

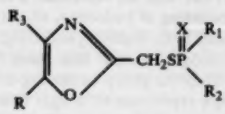
1. A process for preparing a solution of human serum haptoglobin, characterized by subjecting an aqueous solution of α- and β-globulin fractions of human blood plasma to further fractionation by use of ammonium sulfate, collecting the fractions precipitated at an ammonium sulfate concentration between 30% W/V and 40% W/V saturation, contacting an aqueous reconstituted solution of the collected fractions with a strong anion exchanger which is epichlorhydrin-crosslinked diethyl (2-hydroxypropyl) aminoethyldextran or guanidoethyl cellulose to absorb haptoglobin onto said anion exchanger, eluting haptoglobin from the anion exchanger, concentrating the resulting eluate and forming the concentrated solution into a physiologically acceptable aqueous solution.

4,137,308
1,3-OXAZOLE PHOSPHATES AND PHOSPHONATES AS INSECTICIDES AND MITICIDES

Arnold D. Gutman, Berkeley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

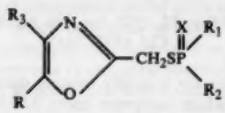
Filed Nov. 11, 1977, Ser. No. 850,764
Int. Cl.² C07D *263/42, 263/32, 263/46;* **A01N** *9/36*
U.S. Cl. 424—200 **39 Claims**

1. A compound having the formula



in which R is phenyl, phenylthio, phenoxy or lower alkylthio; R_1 is lower alkoxy; R_2 is lower alkyl or lower alkoxy; R_3 is lower alkyl and X is sulfur or oxygen, provided that when R is isopropylthio, R_3 is a lower alkyl group containing from 1 to 3 carbon atoms.

36. A method of combatting insects and mites comprising applying to the insect or mite an insecticidally or miticidally effective amount of a compound having the formula



in which R is phenyl, phenylthio, phenoxy, or lower alkylthio; R_1 is lower alkoxy; R_2 is lower alkyl or lower alkoxy; R_3 is lower alkyl and X is sulfur or oxygen, provided that when R is isopropylthio, R_3 is a lower alkyl group containing from 1 to 3 carbon atoms.

4,137,309
THERAPEUTIC TREATMENT

Barry F. Van Duzee, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 14, 1976, Ser. No. 732,226
Int. Cl.² A61K *31/66*
U.S. Cl. 424—204 **5 Claims**

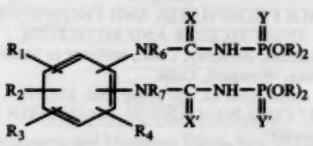
1. A process for treating sickle cell anemia comprising administering to patients in need of such treatment a safe and effective amount of a geminal diphosphonate compound.

4,137,310
METHOD FOR THE CONTROL OF CATTLE GRUBS EMPLOYING A PHENYLENE BIS[IMINO(THIO]CARBONYL)DIPHOSPHOR(THIO)-AMIDIC ACID ESTER

Guang T. Wang, Princeton Junction, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Jun. 5, 1978, Ser. No. 912,812
Int. Cl.² A61K *31/66*
U.S. Cl. 424—204 **10 Claims**

1. A method for the control of larvae of flies of the family Hypodermatidae infesting ruminants and other warm-blooded animals comprising administering to said infested host animal a larvicidally effective amount of a compound having the formula:



wherein R is alkyl (C_1–C_4); R_1 represents a member selected from the group consisting of hydrogen, alkyl (C_1–C_4), fluoro, chloro, bromo, iodo, R_5O, $R_5S(O)_n$ and CF_3; R_2, R_3 and R_4 each represent hydrogen, methyl and halo; R_5 represents a member selected from the group consisting of alkyl (C_1–C_4), benzyl and phenyl; *n* represents an integer from 0 to 2; and X, X', Y and Y' each represent members selected from the group consisting of oxygen or sulfur, provided that X, X', Y and Y' cannot all be O or all be S, and X and X' cannot both be O when Y and Y' are both S.

4,137,311

SYNERGISTIC COMPOSITIONS AND METHOD OF USE

Robert W. Klein, Blue Bell, and George W. Nuss, Jr., Lansdale, both of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Filed Sep. 22, 1977, Ser. No. 835,596
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—240 **18 Claims**

1. A composition for topically treating dermatitis in warm blooded animals which comprises about 0.05 to about 5% by weight of the total composition of the combination of a corticosteroid selected from the group consisting of hydrocortisone, hydrocortisone acetate, hydrocortisone butyrate, hydrocortisone valerate, triamcinolone acetonide, fluocinolone acetonide, 16α-hydroxyprednisolone-16α,17α-acetonide, fluorohydrocortisone and 1-dehydrocortisone and the adducts of bis-(2-pyridyl-1-oxide) disulfide having the empirical formula:

$$(C_5H_4NOS)_2MY_t \quad (I)$$

wherein M represents a member selected from the group consisting of zinc, iron, magnesium, tin, cadmium, zirconium, alkali and alkaline earth metals; Y is the anion of an inorganic or organic acid and t is either 1 or 2, together with a suitable pharmaceutical carrier.

8. A composition for topically treating inflammation in warm blooded animals comprising as active agents the combination of hydrocortisone and bis-(2-pyridyl-1-oxide) disulfide magnesium sulfate and a suitable pharmaceutical carrier, said active agents being present in said composition in an amount of 0.05–5% by weight of composition and said hydrocortisone being present in an amount of 0.01–2.5% by weight of bis-(2-pyridyl-1-oxide) disulfide magnesium sulfate.

9. A method of treating dermatitis in warm blooded animals which comprises topically administering to a warm blooded animal in need of such treatment an effective amount of a corticosteroid, selected from the group consisting of hydrocortisone, hydrocortisone acetate, hydrocortisone butyrate, hydrocortisone valerate, triamcinolone acetonide, fluocinolone acetonide, 16α-hydroxyprednisolone-16α,17α-acetonide, fluorohydrocortisone and 1-dehydrocortisone and at least one adduct of bis-(2-pyridyl-1-oxide) disulfide having the empirical formula:

$$(C_5H_4NOS)_2MY_t \quad (I)$$

wherein M represents a member selected from the group consisting of zinc, iron, magnesium, tin, cadmium, zirconium, alkali and alkaline earth metals; Y is the anion of an inorganic or organic acid and t is either 1 or 2.

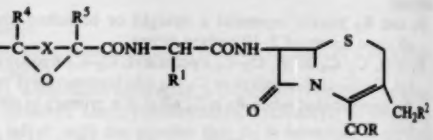
4,137,312

EPOXY SUBSTITUTED CEPHALOSPORIN DERIVATIVES

Barry C. Ross, Birchington, and Braham Shroot, Canterbury, both of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 628,543, Nov. 3, 1975, Pat. No. 4,064,241.
This application Oct. 3, 1977, Ser. No. 838,830
Claims priority, application United Kingdom, Nov. 7, 1974, 48116/74
Int. Cl.[2] A61K *31/545*; C07D *501/34, 501/46*
U.S. Cl. 424—246 **10 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable base salts thereof, wherein

R^1 is a member selected from the group consisting of phenyl, thienyl and 2-furyl, and monosubstituted phenyl wherein the substituent is chosen from the group consisting of halogen, hydroxy, lower alkyl, lower alkoxy and trifluoromethyl;

R is hydroxy, and R^2 is a member selected from the group consisting of halogen, acetoxy, carbamoyloxy and azido,

R^3 is a member selected from the group consisting of carboxy, $COOR^6$ wherein R^6 is chosen from the group consisting of lower alkyl, 5-indanyl, naphthyl, phenyl and monosubstituted phenyl wherein the substituent is chosen from the group consisting of halogen, lower alkyl, lower alkoxy and trifluoromethyl, and $CONR^7R^8$ wherein R^7 and R^8 are each chosen from the group consisting of hydrogen, lower alkyl and cycloalkyl having from three to six carbon atoms;

X is a direct carbon-carbon link; and

R^4 and R^5 are each a member selected from the group consisting of hydrogen and lower alkyl.

9. A pharmaceutical composition comprising a compound as claimed in claim 1 and a pharmaceutically acceptable carrier.

10. A method for treating an animal of diseases caused by Gram-negative and Gram-positive bacteria, which comprises administering to said animal an antibacterially-effective amount of a compound as claimed in claim 1.

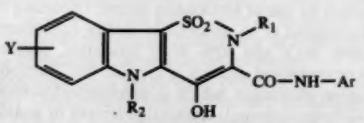
4,137,313

2,5-DIHYDRO-1,2-THIAZINO(5,6-b)INDOLE-3-CARBOXAMIDIE-1,1-DIOXIDES AND SALTS THEREOF

Günter Trummlitz; Wolfhard Engel; Ernst Seeger; Walter Haarmann, and Günter Engelhardt, all of Biderach, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

Filed Jan. 27, 1978, Ser. No. 872,889
Claims priority, application Fed. Rep. of Germany, Feb. 3, 1977, 2704485
Int. Cl.[2] C07D *513/04*; A61K *31/38*
U.S. Cl. 424—246 **9 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, methyl or ethyl;

R_2 is methyl or ethyl;

Y is hydrogen, fluorine, chlorine, bromine, methoxy, methyl, ethyl or trifluoromethyl; and

Ar is 2-thiazolyl which may optionally have one or two methyl or ethyl substituents attached thereto; 5,6-dihydro-4H-cyclopentathiazol-2-yl; 4,5,6,7-tetrahydro-2-benzothiazolyl; 2-benzothiazolyl; 3-isothiazolyl which may optionally have a methyl substituent attached thereto; 2-pyridyl which may optionally have a methyl or hydroxyl substituent attached thereto; 3-pyridyl; 4-pyridyl; 4-pyrimidinyl; pyrazinyl; 2-benzimidazolyl 2-benzoxazolyl; 2-oxazolyl which may have a methyl substituent attached thereto; or phenyl which may optionally have a fluoro, chloro, bromo, methyl, ethyl, trifluoromethyl or methoxy substituent attached thereto;

or a non-toxic, pharmaceutically acceptable salt thereof formed with an inorganic or organic base.

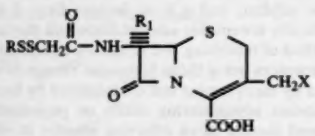
9. The method of combatting inflammation or inhibiting blood platelet aggregation in a warm-blooded animal in need thereof, which comprises perorally, parenterally or rectally administering to said animal an effective antiphlogistic or antithrombotic amount of a compound of claim 1.

4,137,314
7-DITHIOACETAMIDO CEPHALOSPORINS AND PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING THEM HAVING ANTIBACTERIAL ACTIVITY

Robert M. DeMarinis, King of Prussia, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Division of Ser. No. 700,290, Jun. 28, 1976, Pat. No. 4,058,609.
This application Sep. 1, 1977, Ser. No. 830,278
Int. Cl.[2] A61K *31/545;* C07D *501/28*
U.S. Cl. 424—246 8 Claims

1. A chemical compound of the formula:



or a non-toxic pharmaceutically acceptable salt thereof in which:

R is lower alkyl of from 1–4 carbon atoms, trichloromethyl, trifluoromethyl, cyanomethyl, or trifluoroethyl;

R_1 is hydrogen or methoxy;

X is hydrogen or acetoxy.

3. A pharmaceutical composition in dosage unit form having antibacterial activity comprising a pharmaceutical carrier and a chemical compound as defined in claim 1.

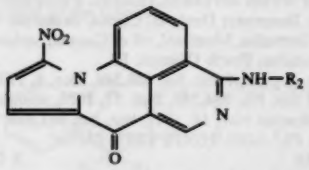
4. The method of producing antibacterial activity which comprises administering parenterally to animals requiring said treatment an amount sufficient to produce said activity a chemical compound as defined in claim 1.

4,137,315
DERIVATIVES OF 10-NITRO-7-OXO-7H-INDOLIZINO[7,6,5-DE]ISOQUINOLINE

Daniel Farge, Thiais; Yves Le Goff, Bretigny-sur-Orge, and Gilbert Poiget, Thiais, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jun. 14, 1977, Ser. No. 806,344
Claims priority, application France, Jun. 16, 1976, 76 18232; Apr. 8, 1977, 77 10763
Int. Cl.[2] C07D *471/14;* A61K *31/475*
U.S. Cl. 424—248.56 13 Claims

1. An indolizino[7,6,5-de]isoquinoline derivative of the general formula:



I

wherein the symbol R_2 represents a hydrogen atom, an amino radical, or a straight- or branched-chain alkyl radical which is optionally substituted on a terminal carbon atom by a vinyl, ethynyl, dialkoxymethyl, hydroxymethyl, dialkylaminomethyl (the alkyl radicals of which may form with the nitrogen atom to which they are attached piperidino, morpholine, piperazin-l-yl or 4-methyl piperazin-l-yl or trialkylammoniomethyl radical, or R_2 represents a straight-chain alkyl radical which is substituted on the terminal carbon atom by an aminomethyl, alkylaminomethyl or hydroxyalkylaminomethyl radical, the alkyl and alkoxy radicals, or moieties of groups, within the definition of symbol R_2 containing from 1 to 4 carbon atoms, and - when appropriate - non-toxic pharmaceutically acceptable salts thereof.

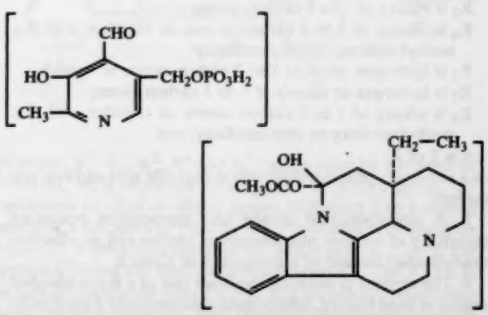
13. A medicinal composition useful as an anti-microbial and antifungal agent which comprises an effective amount of an indolizino[7,6,5-de]isoquinoline derivative as claimed in claim 1, or - when appropriate - a non-toxic pharmaceutically acceptable salt thereof, in association with a suitable diluent.

4,137,316
ANTI-DEPRESSIVE VINCAMINE PYRIDOXAL-5-PHOSPHATE

André Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Paris, France

Filed May 9, 1977, Ser. No. 794,938
Claims priority, application United Kingdom, May 11, 1976, 19290/76
Int. Cl.[2] A61K *31/445;* C07D *519/04*
U.S. Cl. 424—256 2 Claims

2. An anti-depressive composition of matter comprising an effective anti-depressive amount of



together with a therapeutically acceptable carrier therefor.

4,137,317

GLYCERIDES WITH ANTIBACTERIAL PROPERTIES

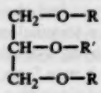
Gerald Y. Paris, Duvernay; Denis G. Cimon, Montreal North, and David L. Garmaise, Montreal, all of Canada, assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 638,246, Dec. 8, 1975, abandoned, and Ser. No. 754,299, Dec. 27, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,003

Int. Cl.[2] A61K *31/455;* C07D *471/04*

U.S. Cl. 424—256 8 Claims

1. A compound of the formula



wherein R is an acyl derivative of the formula CH_3—X—CO— wherein X represents a single bond or a saturated or unsaturated divalent carbon chain of 2–18 carbon atoms and wherein R′ is the acyl moiety of a pharmaceutically acceptable chemically prepared carboxylic acid having anti-bacterial properties.

4,137,318

N-(PHENYLALKYLAMINO-ALKYL)-DIHYDROISOQUINOLINONES, PHARMACEUTICAL COMPOSITIONS AND METHODS EMPLOYING THEM

Wolfgang Eberlein, Biberach; Joachim Heider, Warthausen; Volkhard Austel, Biberach; Jürgen Dämmgen, Warthausen, and Rudolf Kadatz, Biberach, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

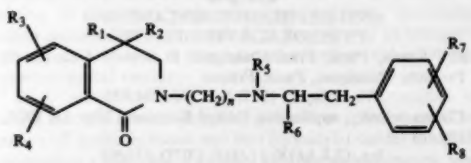
Filed Aug. 22, 1977, Ser. No. 826,853

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1976, 2639718

Int. Cl.[2] A61K *31/47;* C07D *217/24, 223/16;* A61K *31/55*

U.S. Cl. 424—258 6 Claims

1. A compound of the formula



wherein

R_1, R_2 and R_6 are each hydrogen or alkyl of 1 to 3 carbon atoms;

R_3 is alkoxy of 1 to 3 carbon atoms;

R_4 is alkoxy of 1 to 3 carbon atoms, or together with R_3, methylenedioxy or ethylenedioxy;

R_5 is hydrogen, alkyl or 1 to 3 carbon atoms or benzyl;

R_7 is hydrogen or alkoxy of 1 to 3 carbon atoms;

R_8 is alkoxy of 1 to 3 carbon atoms, or together with R_7, methylenedioxy or ethylenedioxy; and

n is 2 or 3;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. A pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective bradycardiac amount of a compound of claim 1.

6. The method of reducing the heart rate of a warm-blooded animal in need thereof, which comprises perorally parenterally or rectally administering to said animal an effective bradycardiac amount of a compound of claim 1.

4,137,319

GUANIDINO, THIOUREIDO, ISOTHIOUREIDO AND NITROVINYLAMINO DERIVATIVES OF PYRIDINE

Graham J. Durant, and Charon R. Ganellin, both of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

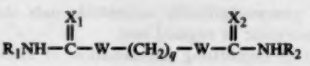
Division of Ser. No. 678,564, Apr. 20, 1976, Pat. No. 4,070,472, which is a division of Ser. No. 542,971, Jan. 22, 1975, Pat. No. 3,968,227. This application Sep. 26, 1977, Ser. No. 836,626

Claims priority, application United Kingdom, Feb. 7, 1974, 5596/74

Int. Cl.[2] A61K *31/44;* C07D *213/78*

U.S. Cl. 424—263 14 Claims

1. A compound of the formula:



wherein R_1 and R_2 are different, each represent a grouping of the structure:

$$\text{Het} - (CH_2)_m Z - (CH_2)_n -$$

wherein Het is a nitrogen containing 5 or 6 membered heterocyclic ring selected from imidazole, pyridine, thiazole, isothiazole, oxazole, isoxazole, pyrazole, triazole, thiadiazole, which is optionally substituted by lower alkyl, hydroxyl, halogen or amino except that one of said terms R_1 and R_2 represents a pyridine containing group but both R_1 and R_2 are not pyridine containing groups; Z is sulphur or a methylene group; m is 0, 1 or 2; n is 2 or 3; and the sum of m and n is 3, 4 or when Y is other than hydrogen, methyl, or hydroxyl, 2; X_1 and X_2, which may be the same or different, are each sulphur, $CHNO_2$ or NY wherein Y is hydrogen, hydroxy, lower alkyl, cyano, $CONH_2$ or SO_2R_3; R_3 is lower alkyl, phenyl, tolyl, trifluoromethyl or amino; W is NH, and when X_1 and X_2 are NH, W may also be sulphur; and q is an integer from 2 to 8; or a pharmaceutically acceptable acid addition salt thereof.

14. A method of inhibiting H-2 histamine receptors, said H-2 histamine receptors being those histamine receptors which are not inhibited by mepyramine but are inhibited by burimamide, which comprises administering orally or parenterally to an animal in need thereof in an effective amount to inhibit said receptors a compound of claim 1.

4,137,320

PHARMACEUTICAL COMPOSITIONS CONTAINING IMIDAZO(2,1-b)THIAZOLES AND PROCESS FOR REDUCING BLOOD SUGAR LEVELS THEREWITH

Enzo Tedeschi, Tel-Aviv, Israel, assignor to Plantex, Ltd., Netanya, Israel

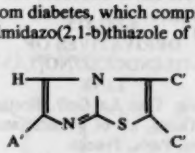
Division of Ser. No. 546,442, Feb. 3, 1975, abandoned. This application Oct. 14, 1976, Ser. No. 732,356

Claims priority, application Israel, Feb. 7, 1974, 44161; Jun. 26, 1974, 45127

Int. Cl.[2] A61K *31/425*

U.S. Cl. 424—270 22 Claims

1. A method for the reduction of the blood sugar level in a patient suffering from diabetes, which comprises administering to said patient an imidazo(2,1-b)thiazole of the formula:



wherein:

A′ is COOR″ and R″ is hydrogen or lower alkyl;

C′ is methyl, tert.-butyl or phenyl; and

D′ is hydrogen or lower alkyl;

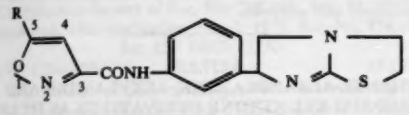
or pharmaceutically acceptable acid salts thereof; in an amount effective for lowering the blood sugar level.

4,137,321
ISOXAZOLE CARBOXAMIDES OF m-AMINOTETRAMISOLE AS ANTHELMINTICS

Michael R. G. Leeming, Canterbury, and John K. Stubbs, Deal, both of England, assignors to Pfizer Inc., New York, N.Y.

Filed Sep. 20, 1977, Ser. No. 834,894
Claims priority, application United Kingdom, Oct. 22, 1976, 44060/76
Int. Cl.[2] C07D *277/60*
U.S. Cl. 424—270 7 Claims

1. The dl- and l- forms of the compounds of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R is hydrogen or methyl.

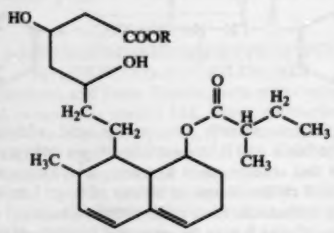
5. A method of treating helminth infections in an infected host comprising administering to said host an anthelmintic amount of a compound as claimed in claim 1.

4,137,322
ML-236B CARBOXYLIC ACID DERIVATIVES AND THEIR USE AS ANTIHYPERLIPEMIC AGENTS

Akira Endo; Akira Terahara; Noritoshi Kitano; Akira Ogiso, and Seiji Mitsui, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Oct. 31, 1977, Ser. No. 847,044
Claims priority, application Japan, Nov. 2, 1976, 51-132044; Dec. 29, 1976, 51-160052; Aug. 8, 1977, 52-94807
Int. Cl.[2] C07C *69/74, 69/30;* A61K *31/215*
U.S. Cl. 424—273 R 16 Claims

1. A compound having the formula



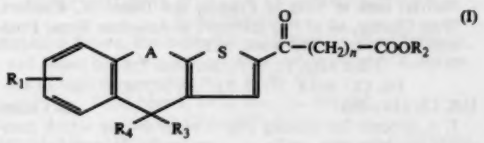
wherein R represents an alkyl group, a benzyl group optionally substituted with alkyl, alkoxy or halogen or a phenacyl group optionally substituted with alkyl, alkoxy or halogen; a group of 1/n M in which M represents a metal and n represents a valency of said metal; or a group of AH^+ in which A represents an amino acid.

4,137,323
ORGANIC COMPOUNDS

Jean-Michel Bastian, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 673,257, Apr. 2, 1976, Pat. No. 4,052,412, and a continuation-in-part of Ser. No. 644,816, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 511,994, Oct. 4, 1974, abandoned. This application Jun. 24, 1977, Ser. No. 809,666
Claims priority, application Switzerland, May 22, 1975, 6582/75
Int. Cl.[2] A01N *9/00;* C07D *333/24, 333/16*
U.S. Cl. 424—275 17 Claims

1. A pharmaceutical composition useful in treating arthritis or oedema comprising a therapeutically effective amount of a compound of the formula



(I)

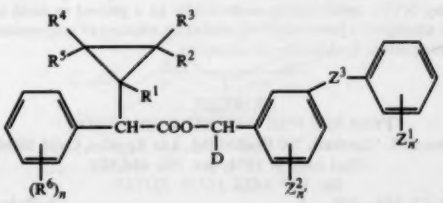
wherein
R_1 is hydrogen, halogen of atomic number from 9 to 35 or lower alkyl,
R_2 is hydrogen or lower alkyl, each of
R_3 and R_4 is hydrogen, or
R_3 and R_4 together are oxygen,
n is 2, 3 or 4, and
A is ethylene or vinylene,
or when R_2 is hydrogen alternatively in pharmaceutically acceptable salt form in association with a pharmaceutical carrier or diluent.

4,137,324
OPTIONALLY SUBSTITUTED PHENYL-α-CYCLOPROPYL ACETIC ACID ESTERS AND USE AS INSECTICIDES

Michael Elliott, Stevenage; Norman F. Janes, Luton, and David A. Pulman, Harpenden, all of England, assignors to National Research Development Corporation, London, England

Filed Apr. 20, 1977, Ser. No. 789,226
Claims priority, application United Kingdom, Apr. 22, 1976, 16234/76
Int. Cl.[2] A01N *9/28, 9/24, 9/20;* C07C *121/52*
U.S. Cl. 424—282 14 Claims

1. A compound of the general formula



in which R^1, R^2, R^3, R^4 and R^5, which may be the same or different, each represent hydrogen or a methyl group, R^6 represents an alkyl or alkoxy group containing 1 to 4 carbon atoms or a halogeno or nitro group or two groups R^6 together represent a methylenedioxy group and n is 0, 1, 2 or 3, the groups R^6 being the same or different when n is 2 or 3, D is H or CN, Z^3 represents CH_2, O, S or CO, Z^1 and Z^2, which may be the same or different, each represent chlorine or a methyl group and each n', which may be the same or different is 0, 1 or 2.

4,137,325
ANTISECRETORY OXAMIC ACID ESTERS

John H. Sellstedt, Pottstown; Charles J. Guinosso; David A. Shriver, both of King of Prussia, and Dieter H. Klaubert, West Chester, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 17, 1977, Ser. No. 778,516
Int. Cl.[2] A61K *31/22, 31/535, 31/44, 31/40*
U.S. Cl. 424—311 15 Claims

1. A process for treating peptic ulcer disease which comprises administering, orally or parenterally, to a mammal in need thereof an anti-secretory amount of an N-substituted lower alkyl or phenyl ester of oxamic acid in which the N-substituent is:

phenyl;
2-carbamyl-3-methoxyphenyl—;
2-carbamyl-3-hydroxyphenyl—;
2-carbamyl-3-benzyloxyphenyl—;
2-carbamyl-3-dimethylaminophenyl—;
2-carbamyl-3-ethyloxalamidophenyl—;
2-carbamyl-3,5-dimethoxyphenyl—;
2-carbamyl-4,6-dimethylphenyl—;
2-carbamyl-4,6-dichlorophenyl—;
4-methoxyphenyl—;
4-methoxy-2-nitrophenyl—;
4-nitrophenyl—;
3-fluorophenyl—;
benzyl—;
biphenylyl—;
phenyl, methyl—;
4-phenoxyphenyl—;
3-methylphenyl—;
2-nitro-4-trifluoromethylphenyl—;
1-naphthyl—;
4-chlorophenyl—; or
2-carbamyl-3-ethylmethylaminophenyl—.

4,137,326
USE OF MAGNESIUM MONOSPARTATE HYDROCHLORIDE COMPLEX

Franz Fischer, and Joachim Helbig, both of Tutzing, Fed. Rep. of Germany, assignors to Verla-Pharm Arzneimittelfabrik, Apotheker H.J.V. Ehrlich, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 567,366, Apr. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 105,731, Jan. 11, 1971, abandoned. This application Feb. 24, 1977, Ser. No. 771,421
Int. Cl.[2] A61K *31/195*
U.S. Cl. 424—319 6 Claims

1. A method of treating heart necroses comprising administering orally, enterally or parenterally to a patient in need of said treatment a heart necrosis inhibiting amount of magnesium monospartate hydrochloride complex.

4,137,327
PROCESS FOR WEIGHT REDUCTION

Edward M. Marshall, 700 Bonhill Rd., Los Angeles, Calif. 90049

Filed May 9, 1974, Ser. No. 468,552
Int. Cl.[2] A61K *31/16, 31/165*
U.S. Cl. 424—324 9 Claims

1. In a weight control process in which a quantity of food is consumed and passes through the gastro intestinal digestive tract of a living body:

said quantity of food including foodstuffs requiring digestion caused by pancreatic enzymes for absorption into the bloodstream from the small intestine, the improvement which comprises

periodically anesthesizing the nerve endings in the digestive tract which release hormones when contacted by food passing through the digestive tract so as to trigger the release of said pancreatic enzymes into the digestive tract by the pancreas prior to said quantity of food contacting said nerve endings only prior to the passage of food into said digestive tract, said anesthetization being carried out to an extent effective and at a time effective to inhibit said nerve endings from releasing sufficient hormones to cause the release of said pancreatic enzymes which will contact said food as it passes through the digestive tract,

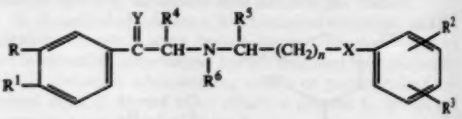
said anesthetization serving to prevent the release of said hormones when said nerve endings are contacted by said quantity of food, this having the effect of preventing release of said enzymes by the pancreas to the digestive tract so that said food passes through the digestive tract without being digested so that it is capable of being absorbed into the bloodstream as a consequence of the absence of said enzymes

4,137,328
PHENYL-ALKANOLAMINE, ALKYLAMINE AND α-AMINOALKYL KETONE DERIVATIVES AS HEART STIMULANTS

David A. Cox, Canterbury; Ian T. Barnish, Ramsgate, and Anthony G. Evans, Westgate-on-Sea, all of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 691,994, Jun. 2, 1976, Pat. No. 4,086,272, which is a division of Ser. No. 443,034, Feb. 15, 1974, Pat. No. 3,976,783, which is a division of Ser. No. 160,529, Jul. 7, 1971, Pat. No. 3,816,516. This application Jan. 27, 1978, Ser. No. 872,810
Claims priority, application United Kingdom, Jul. 18, 1970, 34931/70
Int. Cl.[2] A01N *9/24*
U.S. Cl. 424—324 5 Claims

1. A method of stimulating the heart in an animal subject suffering from congestive heart failure, which comprises administering to said subject an effective amount of a compound selected from the group consisting of substituted 1-phenyl-2-aminoalkanol, 1-phenyl-2-alkylaminoalkane and α-aminoalkyl phenyl ketone bases of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R and R^1 are each hydrogen or hydroxy with the proviso that at least one is hydroxy; R^2 is hydrogen, alkyl of from 1 to 4 carbon atoms or alkoxy of from 1 to 4 carbon atoms; R^3 is formamido, acetamido, propionamido and carbamoyl, any one of which may be separated from the phenyl ring by a methylene or ethylene group; R^4, R^5 and R^6 are each hydrogen or alkyl of from 1 to 4 carbon atoms; X is oxygen, sulfur, imino or a direct link; Y is hydrogen and hydroxy, two hydrogens or oxygen; n is 1 to 3 when X is other than a direct link and 0 to 4 when X is a direct link.

4,137,329
INSECTICIDAL PROPARGYL ETHERS

Walter Hangartner, Schöfflisdorf, and Albert Pfiffner, Bülach, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 606,806, Aug. 22, 1975, abandoned. This application Sep. 6, 1977, Ser. No. 830,924
Claims priority, application Switzerland, Aug. 30, 1974, 11834/74
Int. Cl.[2] A01N *9/24*
U.S. Cl. 424—342 5 Claims

1. A process for protecting materials from pests selected from the group consisting of aphids, whiteflies and mites comprising applying to the material to be protected a pesticidally effective amount of a composition containing as an active ingredient a compound of the formula:

where n is an integer of from 8 to 12 or mixtures thereof and an inert pesticidal carrier.

4,137,330
METAL SALT CATALYZED POLYMERIZATION OF ($NPCl_2$) OLIGOMERS

Mark S. Prichard, Clinton; Ashley S. Hilton, Massillon; Mark L. Stayer, Jr., Suffield, and Thomas A. Antkowiak, Rittman, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 788,480, Apr. 18, 1977, abandoned. This application Feb. 9, 1978, Ser. No. 876,385
Int. Cl.² C01B *25/10*
U.S. Cl. 423—300 **15 Claims**

1. The process of polymerizing a slow or ordinarily non-polymerizing exceptionally pure cyclic oligomer having the structure $(NPCl_2)_n$, wherein n is from 3 to 9, which comprises polymerizing said oligomer at a temperature of from 200°–300° C. under an inert atmosphere or in a vacuum in the presence of from about 0.002 to about 0.50 weight percent of a hydrated inorganic metal halide salt, whereby the percent conversion to the resultant linear polymer represented by the structure $(NPCl_2)_x$, wherein x is between 20 and 50,000, is increased as compared to the percent conversion in the absence of said salt.

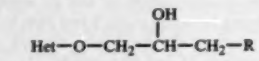
9. The process of polymerizing cyclic oligomers represented by the formula $(NPCl_2)_n$ in which n is from 3 to 9, which comprises polymerizing said oligomers at a temperature of 200°–300° C. under an inert atmosphere or in a vacuum in the presence of from about 0.002 to about 0.50 weight percent of a hydrated inorganic metal halide salt of a metal selected from the group consisting of nickel, cobalt, chromium, magnesium, copper, iron and manganese, whereby the dilute solution viscosity of the resultant linear polymer represented by the formula $(NPCl_2)_x$ in which x is between 20 and 50,000 is reduced to a desired value as compared to the dilute solution viscosity of said polymer prepared in the absence of said salt.

4,137,331
3-PIPERIDINO-2-HYDROXYPROPOXY SUBSTITUTED-2-INDOLINONES

Richard Berthold, and Franz Troxler, both of Bottmingen, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

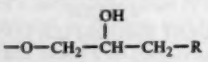
Continuation-in-part of Ser. No. 586,272, Jun. 12, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,781
Claims priority, application Switzerland, Jun. 19, 1974, 8380/74; Jun. 19, 1974, 8381/74; Sep. 23, 1976, 12063/76
Int. Cl.² C07D *401/12;* A61K *31/445*
U.S. Cl. 424—267 **10 Claims**

1. A compound of the formula



wherein

Het is 2-indolinone substituted in the 4-position by the



side chain and

R is

where

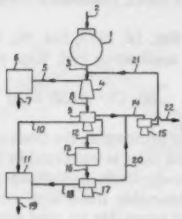
n′ is 4 and the carbon atoms adjacent to the N atom are identically dialkylated by two lower alkyls of 1 to 4 carbon atoms or

a pharmaceutically acceptable acid addition salt thereof.

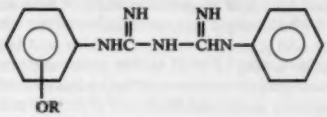
4,137,332
1-(ALKOXYPHENYL)-5-(PHENYL)BIGUANIDE COMPOSITIONS FOR USE AS AGRICULTURAL FUNGICIDES

Michael J. Brown, Randolph; Bruce M. Resnick, West Paterson, and James H. R. Woodland, Bloomingdale, all of N.J., assignors to GAF Corporation, New York, N.Y.

Filed May 1, 1978, Ser. No. 901,720
Int. Cl.² A01N *9/20*
U.S. Cl. 424—326 **7 Claims**



1. A method for controlling the fungi on living plants comprising: contacting said fungi with a fungicidally effective amount of a compound having the formula:

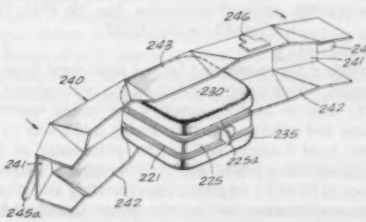


where R is alkyl, linear or branched, having from 1–14 carbon atoms, or acid addition salts thereof.

4,137,333
PACKAGED MEAT SANDWICH

Alexander C. Daswick, 647 Orange Grove, South Pasadena, Calif. 91103

Continuation-in-part of Ser. No. 209,738, Dec. 20, 1971, abandoned. This application Feb. 2, 1976, Ser. No. 654,712
Int. Cl.² B65B *25/22*
U.S. Cl. 426—120 **8 Claims**



6. A prepared meat product packaged for shipping and cooking in the same package, comprising:

a meat patty;

an inner metal foil wrapper removably wrapped about said meat patty;

two pieces of bread arranged in sandwich fashion upon the top and bottom surfaces, respectively, of said wrapped patty; and

an outer metal foil wrapper removably wrapped about the entire sandwich;

such that heat may be conductively transmitted through

both of said wrappers into the side edges of said meat patty for the purpose of cooking it.

4,137,334

PROCESS FOR PRESERVING THE FRESHNESS OF FRESH MEAT USING ACETYLATED FATTY ACID MONO-, DI-, AND TRIGLYCERIDES

Christian Heine, Monheim; Reinhold Wüst, Kaarst b. Neuss, and Brigitte Kamp, Düsseldorf-Wersten, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA), Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Sep. 19, 1977, Ser. No. 834,430

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1976, 2643370

Int. Cl.² A23B *4/10*

U.S. Cl. 426—310 **7 Claims**

1. In a process for prolonging the fresh state of fresh meat, of the type wherein the meat is immersed in a glyceride preservative consisting of completely acetylated molecularly distilled monoglyceride, obtainable from lard, cottonseed oil or partially hydrogenated vegetable oil, and stored at a temperature of 1 to 16° C., the improvement comprising replacing said completely acetylated molecularly distilled monoglyceride with an amount of a completely acetylated fatty acid glyceride mixture comprising 35 to 75 weight percent, relative to the total weight of said fatty acid glyceride mixture, of fatty acid monoglyceride 5 to 50 weight percent, relative to the total weight of said fatty acid glyceride mixture, of fatty acid diglyceride, and 5 to 30 weight percent, relative to the total weight of said fatty acid glyceride mixture, of fatty acid triglyceride, said fatty acids having 12 to 22 carbon atoms and consisting of 70 to 100 mole percent unsaturated fatty acids and said amount of the completely acetylated fatty acid glyceride mixture used as a replacement for the completely acetylated molecularly distilled monoglyceride is at least 50 weight percent of the total glyceride preservative mixture so that said glyceride mixture is in a liquid state in the temperature range from 1 to 16° C.

4,137,335

RECOVERY OF FAT AND MEAT MEAL FROM ANIMAL RAW MATERIAL

Leif G. Holm, Roskilde, and Birgitte N. Korremann-Nielsen, Vanlose Copenhagen, both of Denmark, assignors to Alfa-Laval AB, Tumba, Sweden

Filed Apr. 18, 1974, Ser. No. 462,134

Claims priority, application Sweden, Apr. 19, 1973, 7305613

Int. Cl.² A23C *12/02*

U.S. Cl. 426—417 **2 Claims**

1. A method for recovering fat and meat meal from animal raw material, which comprises boiling the raw material at least mainly by indirect heating, dividing the boiled material into stick water and solids, separately drying said solids to form a first meat meal fraction with a low percentage of protein, separating said stick water into a sludge phase, a stick water phase poor in fat and a fat phase, concentrating said stick water phase by evaporation, dividing the concentrated stick water phase into a sludge phase and a fat phase, and drying the two sludge phases together to form a second meat meal fraction with a high percentage of protein.

4,137,336

DIETETIC COOKIE MIX

Sol B. Radlove, 1165 Pleasant Run Dr., Wheeling, Ill. 60090

Filed Jul. 25, 1977, Ser. No. 818,616

Int. Cl.² A21D *10/00*

U.S. Cl. 426—555 **12 Claims**

1. In a dietetic, dry cookie mix, free of artificial sweeteners, having

(1) a non-shortening portion comprising flour, a sweetener, skim milk solids and dried egg whites;

(2) A shortening portion comprising shortening;

(3) a baking powder portion comprising an acidic component and an alkaline bicarbonate component;

the improvement wherein:

the sweetener is provided essentially by fructose;

the non-shortening portion includes torula yeast in a sufficient amount so that a cookie baked from batter formed when the dry mix is combined with water and mixed has acceptable sweetness.

4,137,337

METHOD AND APPARATUS FOR ADDING SALT OR SEASONINGS TO FOOD BEING COOKED IN STEAM COOKERS

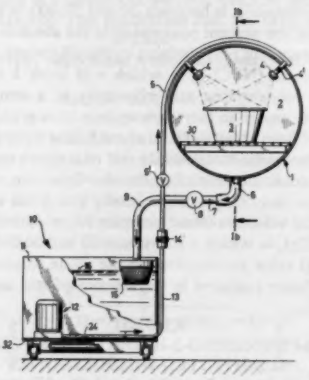
Alfred Löhr, Bochum, and Wolfgang Tschek, Gelsenkirchen, both of Germany, assignors to Kuppersbusch Aktiengesellschaft, Gelsenkirchen, Germany

Continuation-in-part of Ser. No. 556,174, Mar. 6, 1975, abandoned. This application Jul. 28, 1976, Ser. No. 709,292

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1974, 2410552

Int. Cl.² A23L *1/216*

U.S. Cl. 426—637 **9 Claims**



1. A method for cooking food in a steam cooker having a cooking chamber, said method comprising the steps of placing the food to be cooked in at least one container, inserting said container, having food therein, in said cooker and bringing a heated NaCl salt solution or other heated seasoning solution which is heated to a temperature of from about 60° C. to 90° C. into contact with the food before, during or after the steaming process, with the concentration of salt or seasoning in the heated solution being between about 5 and 20% by weight, and the length of contact of the food with the salt or seasoning solution being between 15 and 60 seconds.

4,137,338

STABLE FLUENT EMULSIFIER CONCENTRATE CONTAINING SOLID PHASE EMULSIFIER COMPONENTS

Ilija Gawrilow, Strongsville, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Dec. 3, 1976, Ser. No. 747,296

Int. Cl.² A23D *5/00*

U.S. Cl. 426—601 **22 Claims**

1. A temperature stable fluent food emulsifier concentrate for yeast-raised products, to provide improved dough conditioning and anti-staling properties, consisting essentially of a normally liquid partial glycerol ester food emulsifier vehicle in which is stably dispersed an ethoxylated fatty acid ester and a solid phase betacrystalline food emulsifier component, said concentrate being mechanically dispersible into a comestible

mixture for the emulsification thereof, the proportions of ingredients being about 10 to about 70% liquid partial glycerol ester, about 15 to about 72% ethoxylated fatty acid ester and about 4 to about 54% solid phase beta-crystalline food emulsifier.

4,137,339

METHOD OF PREPARING PROCESSED FOOD MATERIAL FROM SOYBEAN

Shiro Kudo, Ito; Keizo Ishino, Iida, and Yoshinori Takashima, Komagane, all of Japan, assignors to Asahimatsu Koridofu Kabushiki Kaisha, Nagano, Japan

Filed Aug. 29, 1977, Ser. No. 828,749

Claims priority, application Japan, Jan. 25, 1977, 52/7033

Int. Cl.[2] A23L *1/20*; A23J *3/00*

U.S. Cl. 426—634 **6 Claims**

1. A method of preparing a food material from soybean comprising swelling the beans by soaking whole grains of soybean in water, heating the swollen grains at 80 to 200° C. with superheated steam for less than a minute to deactivate the enzyme and tripsin inhibiting substances therein, crushing the grains thus treated in sufficient amount of water to dissolve flatulence producing saccharides followed by further subdividing into finer particles with a homogenizer to completely destroy the soybean cells and adding a protein coagulating agent in amounts sufficient to precipitate the protein together with fat and fibrin.

4,137,340

METHOD FOR FIXING ELECTROPHORETICALLY FORMED TONER IMAGES

Willy G. Verlinden, Edegem; Yvan K. Gilliams, Hever, and Emile F. Stievenart, Hoboken, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 723,294, Sep. 14, 1976, abandoned. This application Jan. 23, 1978, Ser. No. 871,338

Claims priority, application United Kingdom, Sep. 16, 1975, 38069/75

Int. Cl.[2] G03G *13/20*, *13/10*

U.S. Cl. 427—16 **9 Claims**

1. A process for electrophoretically depositing and fixing an electrophoretic toner particle image on a recording material comprising a web support having permanently adhered thereto a thermo-adhesive fixing layer defining the surface on which said toner image particles are deposited, said process comprising the steps of passing said recording material with an electrostatic charge pattern present in said thermo-adhesive fixing layer through an electrophoretic developing liquid comprising finely divided resin-coated pigment particles suspended in an insulating carrier liquid to imagewise deposit said particles on said fixing layer, said resin-coated particles being adapted to form with said thermo-adhesive layer when the latter is in melted condition a contact angle smaller than 90° so that said particles will be wet by molten thermo-adhesive layer, and exposing said surface to at least one short duration high energy light pulse emitting an amount of energy of at least 0.8 $W.s.cm^{-2}$ which has a power output exceeding ½ of its peak power output for a time not longer than 1 ms so as to effect sufficient melting of a surface substratum of the thermo-adhesive layer thus irradiated as to cause said toner particles to become at least partially absorbed into said melted substratum while simultaneously evaporating residual carrier liquid, the duration of said pulse being insufficient to permit diffusion of substantial heat from said fixing layer into said support, whereby permanent deformation of the recording material is avoided and energy consumption is minimized, and allowing said imaged layer to cool and solidify with said image particles embedded in said layer, said thermo-adhesive fixing layer comprising an organic polymeric material and being characterized by a surface resistance above 10^{10} Ohm/square, freedom from blocking at temperatures at least up to 35° C., a melt viscosity at 190° C. of not more than 120 P and an abrasion resistance in excess of 175 g at 20° C., said blocking, abrasion resistance, melt viscosity and contact angle values being determined according to the respective tests described in the specification.

4,137,341

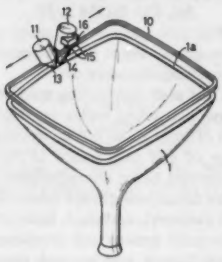
METHOD FOR COATING A LOOP OF A SEAL EDGE OF A CATHODE RAY TUBE WITH VISCOUS MATERIAL

Hiroshi Adachi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 692,328, Jun. 3, 1976, abandoned. This application Apr. 4, 1978, Ser. No. 893,431

Int. Cl.[2] C03C *17/00*, *17/04*

U.S. Cl. 427—64 **8 Claims**



1. A method for applying a viscous material on a substantially horizontal, upwardly facing, loop-shaped surface of a seal edge of a portion of television cathode ray tube comprising the steps of:

disposing at least one pair of nozzle bodies containing said viscous material adjacent to and over but not in contact with the loop-shaped surface;

predetermining initial points and terminal points on said loop-shaped surface for each said pair of nozzle bodies with said initial points for each said pair of nozzle bodies being immediately adjacent each other, and with the terminal point for each of said nozzle bodies being immediately adjacent the terminal point for another of said nozzle bodies;

simultaneously moving said nozzle bodies along a path corresponding to said loop-shaped surface with the nozzle bodies of each said pair thereof being moved in opposite directions starting from said initial points thereof while, at the same time, keeping said nozzles aimed in a fixed direction relative to said surface and discharging the viscous material onto said surface; and

substantially simultaneously halting the movement of said nozzle bodies at the respective terminal points and the discharge of said viscous material therefrom, whereby the loop-shaped surface is coated with a closed continuous, substantially uniform layer of the viscous material.

4,137,342

COBALT-DOPED ACICULAR HYPER-MAGNETITE PARTICLES

Thomas M. Kanten, Baldwin, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 29, 1976, Ser. No. 736,744

Int. Cl.[2] H01F *1/36*

U.S. Cl. 427—127 **4 Claims**

1. Process for making acicular particles useful for magnetic recording media consisting essentially of the steps of

(1) heating acicular alpha-FeOOH particles of submicron size in an inert atmosphere in the presence of a reducing agent at 300°–600° C. to produce acicular hyper-magnetite particles,

(2) depositing a cobalt-containing material onto the surfaces of the hyper-magnetite particles in an amount such that after step (3) the cobalt in the surface layer provides 1–10% by weight of the particles, and

(3) heating in an inert atmosphere at 80° C. to fix the surface deposit without unduly diffusing the cobalt into the particles.

4,137,343

PROCESS FOR PRODUCING PRESSURE-SENSITIVE CARBONLESS TRANSFER SHEETS

Gerald T. Davis; Gerhart Schwab, both of Chillicothe, Ohio, and Dale R. Shackle, Scottsboro, Ala., assignors to The Mead Corporation, Dayton, Ohio

Division of Ser. No. 747,682, Dec. 6, 1976, which is a continuation-in-part of Ser. No. 684,459, May 7, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,534

Int. Cl.² B41M *5/22*

U.S. Cl. 427—150 **8 Claims**

1. A process for producing a pressure-sensitive carbonless transfer sheet comprising the steps of:

(a) preparing a hot melt suspending medium, said hot melt suspending medium being water insoluble and having a melting point of from about 60° C. to about 140° C. and a melting range of less than about 15° C., said hot melt suspending medium being characterized by the presence of one or more functional groups selected from the group consisting of: carboxyl, carbonyl, hydroxyl, ester, amide, amine, heterocyclic groups and combinations thereof to impart polarity thereto, said hot melt suspending medium being further characterized by having a weight loss rating lf less than about 15 mg/g/hr. at 90° C. on a thermogravimetric scale when a 20.0 mg. sample of said hot melt suspending medium is analyzed and a heat resistance characteristic as measured by typewriter intensity decline on a seven day period of less than about 15 units loss when initial typewriter intensity is less than about 75 typewriter intensity units;

(b) preparing a microencapsulated chromogenic material, said chromogenic material being a color precursor of the electron donating type, said chromogenic material being mixed with a carrier oil to form an oil solution of said chromogenic color precursor material, said oil solution being microencapsulated by combination with a wall-forming compound selected from the group consisting of hydroxypropylcellulose, carboxymethylcellulose, gelatin, melamine-formaldehyde, polyfunctional isocyanates and prepolymers thereof, polyfunctional acid chlorides, polyamines, polyols, epoxides and mixtures thereof;

(c) preparing a coating dispersion by combining said hot melt suspending medium with said microencapsulated chromogenic color precursor material, said hot melt suspending medium being compatible with the color forming characteristics of said microencapsulated chromogenic material;

(d) applying said coating dispersion to a substrate, said coating dispersion being applied at a coat weight of from about 1.0 pounds to about 8.0 pounds per 3300 square feet of substrate; and

(e) setting said coated substrate by cooling said coating dispersion.

4,137,344

METHOD OF ENAMELLING SHEETS

Claude Lasne, Antony, and Alain Gernez, St. Jean de la Ruelle, both of France, assignors to Compagnie Generale d'Electricite S.A., Paris, France

Filed Dec. 21, 1977, Ser. No. 862,810

Claims priority, application France, Jan. 4, 1977, 77 00053

Int. Cl.² B65B *33/00*

U.S. Cl. 427—156 **4 Claims**

1. A method of enamelling sheets comprising successively the following steps:

depositing an under-coat of non-pellicular aluminum paint on metal hooks;

suspending said sheets on a support by means of said metal hooks;

depositing a layer of fused enamel component mixture powder on the sheets with the layer also covering at least a part of said hooks;

firing said layer at a temperature high enough to transform it into a layer of enamel and causing the enamel deposited on the under-coat to crack during firing; and

removing, after firing, the layer of cracked enamel from the hooks.

4,137,345

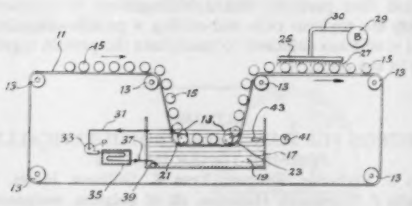
PROCESS FOR THE MANUFACTURE OF FABRIC CONDITIONING ARTICLE

Pasquale J. Falivene, Union City, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Continuation of Ser. No. 82,238, Oct. 20, 1970, abandoned. This application Jun. 10, 1974, Ser. No. 477,916

Int. Cl.² B05D *3/02, 3/12*

U.S. Cl. 427—242 **6 Claims**



1. A method of manufacturing an article for conditioning fabrics by contacting said fabrics with said article to apply a fabric softener composition to the surfaces of said fabrics which comprises raising the temperature of said fabric softener composition selected from amides, alkanolamide, polyoxy lower alkylene containing synthetic organic nonionic surface active agents; higher fatty acid soaps or synthetic organic anionic surface active softeners; quaternary ammonium, cationic surface active softeners, amine cationic surface active softeners, mixtures of soft softener composition with additional softeners, compatible with said softener composition; or mixture of said softener compositions with non-interfering carriers which improve the melting and solidification characteristics of said softener composition until it forms a melt, said melt being substantially free of solvent materials and compounds which would have to be removed to solidify said fabric softener composition at ambient temperature of higher temperature to which said melt is cooled, maintaining said melt at a temperature of from 40° C. to 200° C. at which temperature said melt is a fluid of from 10 to 100 cps viscosity and readily applicable to a base for the fabric softener article, the pore size of said base being sufficiently small to minimize penetration of said melt into said base, applying said melt to said base article so that a surface thereof, adapted to contact said fabric is coated with said melt, said base being substantially solid, dimensionally stable and form-retaining at the temperature of application of said fabric softener composition, and rapidly cooling said composition on said surface at a temperature within the range of from −10° C. to 60° C. so as to convert said composition to a solid state, wherein said composition forms a coating on said base, said coating having a thickness of from 0.0002 to 0.25 inch, the maximum penetration of said melt into said base being about 0.01 inch, and said base has a thickness of at least ¼ inch, said fabric softener composition being sufficiently softened by heat, moisture of a combination of heat and moisture in an automatic laundry dryer so as to be deposited on tumbling moist laundry in contact with said fabric softening composition.

4,137,346

FLAME RETARDING PROCESS FOR PROTEINACEOUS MATERIAL

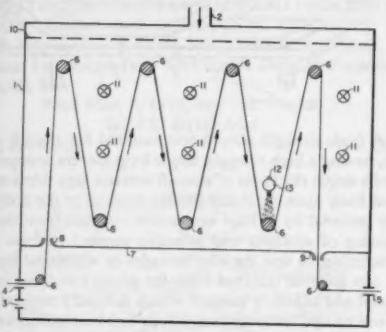
George M. Wagner, Lewiston, N.Y., assignor to Hooker Chemicals & Plastics Corp., Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 628,678, Nov. 3, 1975, Pat. No. 4,068,026, which is a continuation-in-part of Ser. No. 493,815, Aug. 1, 1974, Pat. No. 3,933,122, which is a division of Ser. No. 344,574, Apr. 17, 1972, Pat. No. 3,846,155. This application Sep. 16, 1977, Ser. No. 833,841

The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.

Int. Cl.[2] C09K *3/28;* B05D *3/04*

U.S. Cl. 427—341 26 Claims



1. A process for rendering proteinaceous material durably flame retardant comprising

a. Impregnating a material selected from the group consisting of proteinaceous materials and blends of proteinaceous material with synthetic material with a flame retarding solution comprising poly(hydroxymethyl) phosphonium cation having a pH of from about 2 to about 9, and containing from about 10 to about 40 percent by weight of poly(hydroxymethyl) phosphonium cation;

b. Drying the impregnated material, to a moisture content of from about 0 to about 8 percent by weight;

c. Aerating the dried material by directing a current of air through the dried material;

d. Exposing the aerated material in an enclosed chamber for a period of at least about 5 seconds but less than about 60 seconds to an atmosphere containing at least about 50 percent by volume of gaseous ammonia to cure the phosphorus containing impregnant in and on the material;

e. Contacting the material with water to render the material durably flame retardant; and

Further exposing the water contacted material for a period of from 1 to about 10 seconds to an atmosphere containing at least about 50 percent by volume of gaseous ammonia.

4,137,347

METALLIC COATING METHOD

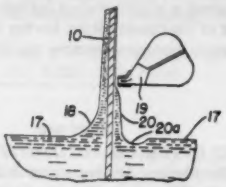
Hart F. Graff, Middletown; John B. Kohler, Greentown; Noel W. Parks, Middletown; Marvin B. Pierson, Middletown; Paul E. Schnedler, Middletown, all of Ohio, and Richard E. Strait, Ashland, Ky., assignors to Armco Steel Corporation, Middletown, Ohio

Continuation of Ser. No. 841,936, Jul. 15, 1969, abandoned. This application Sep. 6, 1977, Ser. No. 830,457

Int. Cl.[2] B05C *11/10*

U.S. Cl. 427—349 3 Claims

1. In a method of coating a flat ferrous metallic strip with a molten coating metal, wherein the still molten coating metal is finished by an elongated jet of gaseous fluid, the improvement which comprises the step of eliminating heavy edge coatings and oxide berries to produce an even coating weight from edge-to-edge across said strip, by contouring the narrow dimension of said jet to provide a relatively narrow center, said jet widening from said center to each of said strip edges, the



length of said jet from said metallic strip to the source of said jet being uniform across the width of said strip.

4,137,348

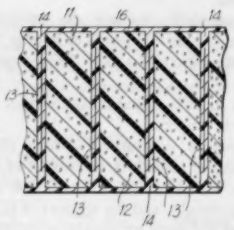
PROTECTIVE MAT AND METHOD OF MAKING SAME

Richard L. Gilman, Gilman, Conn. 06336

Filed Dec. 23, 1977, Ser. No. 863,849

Int. Cl.[2] B32B *3/02, 27/00, 31/18*

U.S. Cl. 428—33 8 Claims



1. A mat having vertically spaced substantially horizontal parallel wide top and bottom faces and comprising a plurality of elongated thin strips of a recoverably compressible cellular thermoplastic polymeric resin having skins formed on the wide opposing faces thereof, said strips being disposed in face-to-face parallel relationship with the skins of adjacent strips being contiguous and bonded to each other along their borders to form a coherent body and said skins extending substantially vertically between said top and bottom faces.

4,137,349

PROCESS FOR FORMING MULTI-LAYER COATINGS

Takao Sakakibara, Kasugai, and Haruhiko Okazaki, Iwakura, both of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed Dec. 20, 1976, Ser. No. 752,086

Claims priority, application Japan, Dec. 26, 1975, 50-155964

Int. Cl.[2] B32B *15/00;* D02G *3/00*

U.S. Cl. 427—380 9 Claims

1. A process for forming a multi-layer coating including at least two layers on a metal substrate which comprises applying to said substrate a lower coating layer, which is a paint selected from the group consisting of water soluble paints, emulsion paints, slurry paints and organic solvent dilution type paints, partially drying said coating layer to a non-flowing, at least set-to-touch state, the amount of the volatile component left in the lower coating layer being (a) not higher than 5% by weight in the case of an organic solvent dilution type paint, and (b) between 3 and 30% by weight in the case of a water soluble paint, emulsion resin paint and slurry paint, then applying thereon at least once a slurry paint consisting of thermosetting synthetic resin particles to form a laminate coating, the slurry paint comprising 10 to 70% by weight of resin particles dis-

persed in a medium composed mainly of water, said resin particles having an average particle size of 4 to 30 microns and a softening point of 5° to 120° C., and baking the resulting laminate coating at a temperature higher than the film-forming temperature of the coating layer having the highest film-forming temperature among respective coating layers.

4,137,350

PAINTED EXTERIOR AUTOMOTIVE BODY PARTS

Arthur A. Blaskiewicz, Danbury, and Julian M. Mitchell, New Haven, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 613,695, Sep. 15, 1975, abandoned. This application Feb. 25, 1977, Ser. No. 772,372

Int. Cl.² C08L *9/02, 9/06*

U.S. Cl. 428—31 **3 Claims**

1. A painted exterior automotive body part which is a shaped article made of a vulcanized elastomeric composition comprising a blend of (A) an ungrafted elastomeric monoolefin copolymer rubber of low unsaturation with (B) a highly unsaturated conjugated diolefin polymer rubber, and (C) sulfur, the said monoolefin copolymer rubber (A) of low unsaturation being a binary copolymer or a terpolymer of:

(a) ethylene;

(b) a monoolefin having the structure CH_2═CH—R wherein R is an alkyl radical having from 1 to 12 carbon atoms, the ratio of (a) to (b) being from 90/10 to 50/50 by weight; and

(c) from 0 to 15%, based on the weight of (A), of a copolymerizable polyene;

the said highly unsaturated rubber (B) being a polymer containing at least 50% by weight of conjugated diolefin, the ratio of (A) to (B) in the blend being from 70:30 to 85:15 by weight, and the amount of (C) being from 6 to 12 parts per 100 parts by weight of (A) plus (B), said composition having a flexural modulus of from 4,000 to 75,000 psi and a 10% modulus of from 100 to 1,800 psi, and an elongation of from 25 to 250%, the paint on the surface of said article adhering thereto sufficiently firmly that the painted article passes the cross hatch, water immersion, galvanic action and thermal shock automotive industry tests referred to herein.

4,137,351

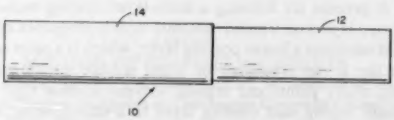
FILAMENT/EPOXY CAMOUFLAGE LAUNCH TUBES

Glen A. Clodfelter, Madison, and Ocke C. Fruchtnicht, Huntsville, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 3, 1978, Ser. No. 892,542

Int. Cl.² F41F *17/08;* F16L *9/12;* F41F *3/04*

U.S. Cl. 428—36 **4 Claims**



1. A cured camouflage launch tube comprising a wound glass fiber structure that is secured together with an epoxy resin system and with coloring agents in the epoxy resin system to color the launch tube the same camouflage color throughout the entire wall thickness, said coloring agents being carbon black and yellow iron oxide and possesses thermal and color stability under the resin curing conditions.

4,137,352

METHODS OF MAKING LOOPS IN STRIP FABRIC MATERIAL

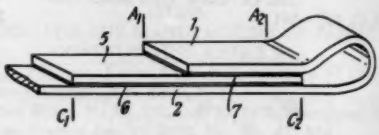
Arthur L. Stonebridge, Bradford, England, assignor to BBA Group Limited, England

Continuation of Ser. No. 804,582, Mar. 5, 1969, abandoned. This application Nov. 30, 1971, Ser. No. 203,411

Claims priority, application United Kingdom, Mar. 13, 1968, 12207/68

Int. Cl.² B32B *3/06*

U.S. Cl. 428—102 **13 Claims**



1. A high-strength strip fabric material for aircraft arrester tapes, having a high strength single loop therein, comprising an end of a single thickness of aircraft arrester tape fabric material turned back upon itself and fixedly secured to the body of the fabric material by at least one means selected from the group consisting of stitching and adhesive cement to form a joint, characterized in that the joint includes an additional layer of at least one material selected from the group consisting of fabric material and adhesive cement which is fixedly secured to said end and to said body by said means and located between said end and said body, which gives a greater extension for a given base load than the fabric material in which the loop is formed, the relationship between the thickness of the additional layer and the thickness of the fabric material of the strip being in the range of ratios from 2:1 to 1:2.

4,137,353

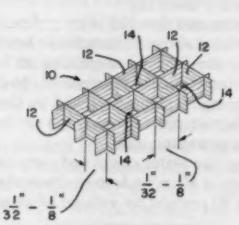
FABRIC COMPRISING A NOVEL TYPE OF NETTING

Leonard A. Fariello, Box 173, Troy Meadows Rd., Whippany, N.J. 07981

Filed May 27, 1975, Ser. No. 580,731

Int. Cl.² B32B *5/12*

U.S. Cl. 428—112 **6 Claims**



1. A fabric for body protection, comprising:

a multiplicity of continuous first strands lying in a first plane parallel to, and spaced apart from each other in said first plane;

a multiplicity of continuous, second strands lying in a second plane which is parallel to said first plane, said second strands lying in said second plane parallel to, and spaced apart from each other;

a multiplicity of continuous third strands, parallel to and spaced apart from each other, and extending perpendicular to and coupled to said first strands;

a multiplicity of continuous fourth strands, parallel to and spaced apart from each other, and extending perpendicular to and coupled to said second strands; and

means coupling between said first and second strands and said third and fourth strands, only in a plane normal to

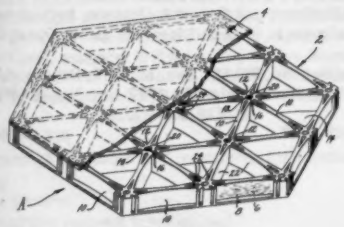
both said first and second planes and said fabric, effecting a spaced-apart relationship between said first and second strands and between said third and fourth strands; wherein said first, second, third and fourth strands, and said coupling means, cooperate to define a first multiplicity of throughgoing voids, extending perpendicularly of said first and second planes, and a second multiplicity of throughgoing voids which extend parallel with said first and second planes, in said fabric.

4,137,354

RIBBED COMPOSITE STRUCTURE AND PROCESS AND APPARATUS FOR PRODUCING THE SAME

James T. Mayes, Jr., St. Louis, Mo., and Will A. Rosene, New Orleans, La., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Mar. 7, 1977, Ser. No. 774,760
Int. Cl.[2] B31D *3/02*
U.S. Cl. 428—116 **17 Claims**



1. A composite structure comprising: a plurality of filaments arranged in distinct rows with the filaments of each row being built up on each other in a stacked disposition, the rows being oriented at different angles and intersecting each other at nodes where the filaments of the intersecting rows remain intact and are interlaced, each node including a central area and the filaments of each row which passes through that node being located on both sides of the central area for the node so that those filaments where they are interlaced with the filaments of another row do not create an excessive build-up of filaments at the node; and a rigid matrix in which the filaments of the rows are embedded, the matrix holding the filaments together to form a rigidified grid-like structure having rigid webs which are joined together at the nodes.

4,137,355

CERAMIC COATED WITH MOLTEN SILICON

Joseph D. Heaps, Shakopee, and Obert N. Tufte, Minnetonka, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 748,982, Dec. 9, 1976, Pat. No. 4,112,135, Continuation of Ser. No. 625,443, Oct. 24, 1975, abandoned.
This application Dec. 19, 1977, Ser. No. 861,760
Int. Cl.[2] B32B *3/10, 9/04*
U.S. Cl. 428—201 **3 Claims**

1. A crystalline silicon coating on a ceramic substrate comprising:

a ceramic substrate of a type which is not wet by molten silicon;

an interface layer comprising carbon on at least a portion of the surface of said ceramic body to render said surface portion wettable by molten silicon; and

a layer of crystalline silicon grown onto said carbon coated ceramic by contacting the carbon coated ceramic with molten silicon to form said silicon layer.

4,137,356

NON-SKID PLACE MAT AND THE LIKE

Charles T. Shoemaker, and Joseph P. Engler, both of Oshkosh, Wis., assignors to The Hoffmaster Company, Inc., Oshkosh, Wis.

Filed Oct. 25, 1977, Ser. No. 844,903
Int. Cl.[2] B32B *3/00, 29/00*
U.S. Cl. 428—211 **2 Claims**

1. An article useful as a place mat, coaster or the like comprising:

a flat or planar sheet of paper; a plurality of discrete, spaced first projections extending from the top surface of said paper, said first projections consisting essentially of foamed thermoplastic polymeric material providing a high coefficient of friction;

a plurality of discrete, spaced second projections extending from the bottom surface of said sheet of paper, said second projections consisting essentially of foamed thermoplastic polymeric material providing a high coefficient of friction;

said first and second projections being substantially integral with said top and bottom surfaces, respectively, of said sheet of paper and being arranged and aligned as illustrated in FIGS. 2 and 3, respectively, of the drawings.

4,137,357

PLASTIC THERMOSET LAMINATES

Roger D. Emmons, Decorah, Iowa, assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 25, 1977, Ser. No. 844,664
Int. Cl.[2] B32B *7/00*
U.S. Cl. 428—245 **3 Claims**

1. A high pressure plastic thermoset post-forming laminate consisting essentially of a blended fabric substrate consisting of natural cotton fibers woven with polyester wherein said substrate has a phenol-formaldehyde resin impregnated therein.

4,137,358

MICRO-CRYSTALLINE WAX DIP FORMULATION ADDITIVES FOR PROTECTION OF ADHESIVE-COATED FABRICS AND SINGLE END CORDS

Roy E. Hartz, Columbia, S.C., assignor to Uniroyal, Inc., New York, N.Y.

Filed Jun. 10, 1976, Ser. No. 694,498
Int. Cl.[2] B32B *23/02, 27/02;* **C08L** *61/12, 91/06*
U.S. Cl. 428—272 **9 Claims**

1. A fabric or single end cord made from a polyamide, aramid, polyester, or rayon cord and coated with 3 to 10 weight percent, based on the fabric weight, of a dried adhesive comprising: (1) a resorcinolformaldehyde condensate, (2) a vinyl pyridine-butadiene-styrene rubbery terpolymer or butadiene-styrene rubber copolymer composition, and (3) a wax composition consisting essentially of a microcrystalline wax having a melting point of 160° to 215° F. and a molecular weight of up to about 1,500, said percent being based on the dry weight of rubber in the resin-rubber dip, said coated fabric or single end cord having the characteristic of better retention of adhesion after exposure to the products of combustion present in fuel oil or kerosene-fired dryers and curing ovens and oxidation caused by atmospheric pollutants.

7. An adhesive dip formulation for application to fabric or single end cord made from a polyamide, aramid, polyester or rayon cord which is subsequently to be adhered to rubber in vulcanized shaped rubber articles comprising a dip of (1) a resorcinol-formaldehyde condensate, (2) a latex of vinyl pyri-

dine-butadiene-styrene rubbery terpolymer or butadiene-styrene rubber copolymer and (3) from about 3 to about 10 weight percent of a wax composition, wherein the wax in said dip formulation consists essentially of a microcrystalline wax having a melting point of 160° to 215° F. and a molecular weight of up to about 1500, said percent being based on the dry weight of rubber in the resin-rubber dip.

4,137,359

ELASTOMERS WITH IMPROVED METAL ADHESION

Eugene Bak, Polk, Pa., and Albert V. Collins, Fairview Park, Ohio, assignors to Mooney Chemicals, Inc., Cleveland, Ohio

Filed Oct. 31, 1977, Ser. No. 847,261

Int. Cl.[2] C08K *5/09;* **B32B** *15/08;* **C08L** *13/00*

U.S. Cl. 428—295 **29 Claims**

1. A vulcanizable elastomeric composition comprising an elastomer and from about 0.001 to 0.01 pound mole of metal per 100 pounds of elastomer, the metal content comprising at least one metal which is an oxidizing constituent and a second metal which is a polymerizing constituent or calcium, said metals being present as either

(a) an organic carboxylic acid salt of two different metals combined with one or more carboxylic acids, or

(b) a combination of two or more different metal salts of organic carboxylic acids, or

(c) a combination of a metal salt of an organic carboxylic acid and a mixed organic acid salt complex.

10. A method of improving the adhesion between a vulcanizable elastomeric composition and a brass coated metal surface to provide a strong and durable bond comprising the steps of

(a) providing an elastomeric vulcanizable composition containing from about 0.001 to about 0.01 pound moles of metal per 100 pounds of elastomer, the metal content comprising at least one first metal which is an oxidizing constituent and a second metal which is a polymerizing constituent or calcium, said metals being present as either

(i) an organic carboxylic acid salt of two different metals combined with one or more carboxylic acids, or

(ii) a combination of two or more different metal salts of organic carboxylic acids, or

(iii) a combination of a metal salt of an organic carboxylic acid and a mixed organic acid salt complex;

(b) contacting the elastomeric composition prepared in step (a) with a brass coated metal surface, and

(c) vulcanizing the elastomeric composition while in contact with the metal.

4,137,360

MICROPOROUS SHEETS AND A PROCESS FOR MAKING THEM

Artur Reischl, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

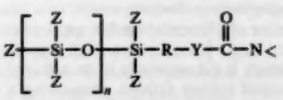
Filed Aug. 28, 1974, Ser. No. 501,321

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1973, 2345257

Int. Cl.[2] B32B *27/40*

U.S. Cl. 428—310 **9 Claims**

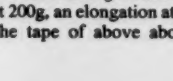
1. In a process for making microporous sheets which are permeable to water vapor comprising applying a polyurethane in a hygroscopic polar solvent to a substrate, coagulating the polyurethane with a non-solvent for the polyurethane, removing the solvent and non-solvent, and optionally, removing the substrate, the improvement which comprises coagulating a solution containing a polyurethane which has the following structural unit



in which

$n \geqq 2$

Z = an alkyl group containing 1 to 5 carbon atoms, an aryl radical containing 6 to 15 carbon atoms, a siloxyl or siloxanyl group or



the groups Z being the same or different;

R = an alkylene group and

Y = —NH—, —O—, —S— or NR_1

where

R_1 is an alkyl group containing 1 to 5 carbon atoms or a cyclohexyl radical

and the total quantity of siloxane sequences in the microporous polyurethane sheet is about 0.1 to about 20% by weight.

6. The product of the process of claim 1.

4,137,361

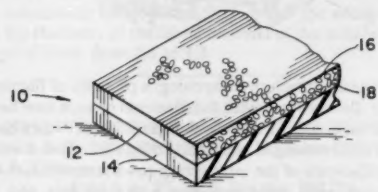
POWDER PRODUCTS

Robert J. Deffeyes, and Grover L. Johnson, both of Arlington, Tex., assignors to Graham Magnetics Incorporated, Graham, Tex.

Division of Ser. No. 540,521, Jan. 13, 1975, Pat. No. 4,092,459. This application Mar. 30, 1977, Ser. No. 783,075

Int. Cl.[2] B32B *15/02*

U.S. Cl. 428—328 **16 Claims**



16. An article of manufacture, a magnetic recording member comprising a substrate and on said substrate a coating formed of a conductive composition comprising (1) a mass of small particles formed of a core material of an electroconductive metal and a thin electrically-conductive, corrosion-resistant, surface layer of a conductive silicide, boride or carbide and (2) a resin matrix for said particles within which said particles are dispersed and form means to conduct electricity.

4,137,362

PRESSURE SENSITIVE ADHESIVE TAPES

Yoshio Miki; Hideo Nishizawa, and Yukio Suzuki, all of Ibaraki, Japan, assignors to Nitto Electric Industrial Co., Ltd., Ibaraki, Japan

Continuation of Ser. No. 501,109, Aug. 27, 1974, abandoned. This application Feb. 10, 1977, Ser. No. 767,421

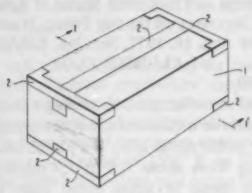
Claims priority, application Japan, Aug. 27, 1973, 48-95825

Int. Cl.[2] B32B *27/32;* **C09J** *7/02*

U.S. Cl. 428—337 **21 Claims**

1. In a pressure sensitive adhesive tape for sealing cartons comprising a backing having thereon a pressure sensitive adhesive layer, the improvement which comprises said backing consisting of a unitary sheet having lengthwise and transverse directions of polypropylene as a main component stretched in the substantially transverse direction such that the stretching ratio in the transverse direction is at least 4 and the sheet is not stretched lengthwise or the stretching ratio in the lengthwise direction is less than 3 and having a shock edge tearing resistance of below about 200g, an elongation at break in the lengthwise direction of the tape of above about 200%, a tensile

strength in the lengthwise direction of the tape of above about 170 kg/cm^2, a tensile strength in the transverse direction of the tape of above about 800 kg/cm^2, an impact strength in the



lengthwise direction of the tape of above about 15 kg.cm/mm^2 and above 40 kg.cm/mm^2 in the transverse direction, and a thickness of about 10 to 300 microns.

4,137,363

MATRIX MATERIAL FOR PRINTING PLATES AND METHOD OF MANUFACTURE THEREOF

Clarence G. Maron, Vernon, and Donald W. Sundstrom, Storrs, both of Conn., assignors to Rogers Corporation, Rogers, Conn.

Continuation of Ser. No. 581,380, May 27, 1975, abandoned. This application Apr. 5, 1977, Ser. No. 784,733

Int. Cl.^{2} B41B *5/02*

U.S. Cl. 428—338 **16 Claims**

1. A sheet of moldable matrix material for printing plates, including :

fibrous material;

thermosetting resinous material; and

microbubbles;

said fibrous material, said thermosetting resinous material and said microbubbles being substantially uniformly distributed throughout said sheet of matrix material, said thermosetting resinous material in said sheet of matrix molding material being less than fully cured and said sheet of matrix material being moldable under heat and pressure to form a printing plate matrix having sharp character definition.

8. The method of forming a sheet of moldable matrix material for printing plates, including the step of:

mixing fibrous material, thermosetting resinous material and microbubbles to form a substantially uniform furnish; and

forming said furnish into sheet material having said fibrous material, thermosetting resinous material and microbubbles dispersed substantially uniformly throughout said sheet material, said thermosetting resinous material being less than fully cured and said sheet of matrix material being moldable under heat and pressure to form a printing plate matrix having sharp character definition.

4,137,364

TRANSPARENT LAMINATE AND ADHESIVE FILM

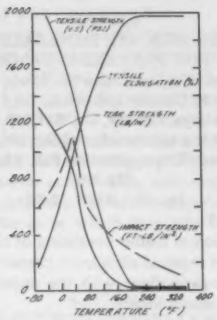
George L. Ball, III, West Carrollton; Dennis W. Werkmeister, New Lebanon, and Ival O. Salyer, Dayton, all of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Filed Nov. 5, 1976, Ser. No. 739,367

Int. Cl.^{2} B32B *27/36, 17/10;* **C08F** *8/00*

U.S. Cl. 428—412 **12 Claims**

1. An optically clear adhesive film useful in laminates comprising an ethylene/vinyl acetate/vinyl alcohol terpolymer having a hydroxyl content in the range of 1% to 6%, said terpolymer having been formed by partial hydrolysis of an ethylene/vinyl acetate copolymer having a vinyl acetate content in the range of 40% to 60%, and said terpolymer in film form having been heat treated and crosslinked by means of radiation or curing in the presence of an effective amount of a crosslinking agent selected from the group consisting of vinyl triethoxy silane and isophthaloyl biscaprolactam to give said



adhesive film having a temperature utility in laminates in the range of −65° F. to at least 350° F.

4,137,365

OXYGEN POST-TREATMENT OF PLASTIC SURFACES COATED WITH PLASMA POLYMERIZED SILICON-CONTAINING MONOMERS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Theodore J. Wydeven, Jr., Sunnyvale, and John R. Hollahan, San Francisco, both of Calif.

Continuation-in-part of Ser. No. 634,304, Nov. 21, 1975, abandoned. This application Mar. 21, 1977, Ser. No. 779,883

Int. Cl.^{2} B05D *3/06*

U.S. Cl. 428—412 **6 Claims**

1. A method for improving the abrasion resistance of polymerized organosilane coatings on a plastic substrate which comprises treating the silane coated substrate in an oxygen plasma.

5. A plastic substrate coated with an oxygen plasma treated polymer of an organosilane compound.

4,137,366

INTERIOR FINISH LAMINATES COMPRISING A FOAM LAYER APPLIED THROUGH USE OF POLYAMIDE ADHESIVES

Yuichi Harada, and Yoshinobu Ohya, both of Amagasaki, Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Jan. 5, 1977, Ser. No. 756,839

Claims priority, application Japan, Jan. 16, 1976, 51-3877

Int. Cl.^{2} B32B *5/18, 17/10, 27/08, 27/34, 31/04*

U.S. Cl. 428—425 **8 Claims**

1. A motorcar interior finish material comprising a frame, an adhesive film adhered to said frame, a polyurethane foam layer whose inner surface is adhered to said adhesive film and a polyvinyl chloride sheet adhered to the outer surface of said polyurethane foam layer, said adhesive film consisting essentially of a polyamide copolymer composed of at least three different polyamide-forming monomers, at least one of which is lauryl lactam or ω-aminoundecanoic acid, said polyamide copolymer having a melting point of 80° to 140° C.

6. A motorcar interior finish material comprising a frame, an adhesive film adhered to said frame, a polyurethane foam layer whose inner surface is adhered to said adhesive film and a polyvinyl chloride sheet adhered to the outer surface of said polyurethane foam layer, said adhesive film consisting essentially of a blend of ethylene/vinyl acetate copolymer resin containing 5 to 20% of vinyl acetate and a polyamide copolymer composed of at least three different polyamide-forming monomers, at least one of which is lauryl lactam or ω-aminoundecanoic acid, said polyamide copolymer having a melting point of 80° to 140° C., the amount of said ethylene/vinyl

acetate copolymer resin being from 3 to 15 parts by weight per 100 parts by weight of said polyamide copolymer.

4,137,367

SILANE COATED SILICATE MINERALS AND METHOD FOR PREPARING SAME

Thomas E. Sample, Jr., and John M. Horn, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 637,339, Dec. 3, 1975, abandoned, which is a continuation of Ser. No. 513,984, Oct. 11, 1974, abandoned. This application Feb. 28, 1977, Ser. No. 772,380

Int. Cl.[2] B32B *19/08*

U.S. Cl. 428—443 **9 Claims**

1. A composition of matter consisting of chrysotile asbestos mineral having an exposed silica layer chemically bonded to an outer layer of organo-silane with the underlying octahedral oxide layers essentially intact.

4,137,368

COATING COMPOSITIONS AND PROCESSES

Russell C. Miller, Chicago, Ill., assignor to J. M. Eltzroth & Associates, Inc., Schaumburg, Ill.

Division of Ser. No. 679,694, Apr. 23, 1976, Pat. No. 4,069,187, which is a continuation of Ser. No. 505,212, Sep. 12, 1974, abandoned. This application Oct. 25, 1977, Ser. No. 845,469

The portion of the term of this patent subsequent to Jan. 10, 1995, has been disclaimed.

Int. Cl.[2] B32B *15/08*; C23F *7/26*

U.S. Cl. 428—461 **10 Claims**

1. A process of protecting metals which comprises coating said metals with an emulsion coating composition containing water in the continuous phase and having in the discontinuous phase at least one water insoluble particulate film-forming thermoplastic resin and a water insoluble pigment selected from the group consisting of strontium chromate, calcium silicofluoride and a chromate containing calcium silicofluoride, the weight ratio of said pigment to said resin being within the range of 1:99 to 40:60, the solids content of said composition being within the range of 15–35% by weight, excluding pigmentation, said composition also containing a substance from the group consisting of ammonium hydroxide, dimethylethanolamine and diethanolamine, the viscosity of said composition being within the range of 25–45 seconds on a Zahn #1 cup and 17–35 seconds on a Zahn #2 cup, and thereafter removing water from said composition, the amount of said composition applied to the metal being sufficient to produce a uniform coating having a wet thickness within the range of 0.05 mil to 10 mils.

9. A metal coated with a coating composition as claimed in claim 1.

4,137,369

VISUAL DYE INDICATOR OF SOLDER WICKING ACTION IN METAL COATED COPPER BRAID

Saul W. Chaikin, Sunnyvale, Calif., assignor to Wik-It Electronics Corporation, Sunnyvale, Calif.

Filed May 3, 1977, Ser. No. 793,330

Int. Cl.[2] B23P *19/00*

U.S. Cl. 428—624 **8 Claims**

1. A metal desoldering wick comprising:

(a) stranded copper wires forming a wick;

(b) a coating of tin surrounding said copper wires and;

(c) a coating surrounding said tin coating and including a soldering flux which imparts substantially no coloration to the wick and an indicator agent which exhibits a visually observable change in appearance upon exposure to the heat of the soldering operation to clearly demark the portion of the wick into which molten solder has been absorbed.

4,137,370

TITANIUM AND TITANIUM ALLOYS ION PLATED WITH NOBLE METALS AND THEIR ALLOYS

Shiro Fujishiro, Yellow Springs, and Daniel Eylon, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 16, 1977, Ser. No. 825,005

Int. Cl.[2] B32B *15/00*

U.S. Cl. 428—660 **3 Claims**

1. An article of manufacture comprising a component fabricated from titanium or a titanium alloy, the component having a noble metal or noble metal alloy ion plated coating having a thickness ranging from about 0.5 to 1.5 microns cohesively bonded to noble metal or noble metal alloy ion implanted surfaces of the component, the noble metal being ruthenium, rhodium, palladium, osmium, iridium, gold or platinum.

4,137,371

ELECTROCHEMICAL ZINC-OXYGEN CELL

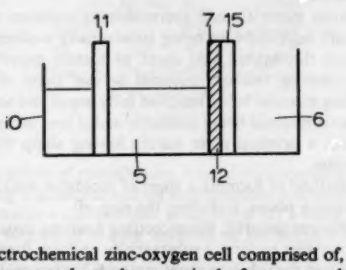
Alain P. O. Blanchart, Balen; Gustaaf J. F. Spaepen, Dessel, and Constantine W. M. V. A. De Brandt, Itterbeek, all of Belgium, assignors to Electrochemische Energieconversie N.V., Mol, Belgium

Filed Jul. 5, 1977, Ser. No. 812,892

Claims priority, application Netherlands, Jul. 7, 1976, 7607471

Int. Cl.[2] H01M *8/08, 12/04*

U.S. Cl. 429—29 **5 Claims**



1. Electrochemical zinc-oxygen cell comprised of,

a. an oxygen electrode comprised of a porous electrically conductive layer and an ion-exchanging layer, said layers containing an identical binder,

b. a zinc electrode; and

c. an electrolyte space between said ion-exchanging layer and said zinc electrode which contains a liquid basic electrolyte.

4,137,372

CATALYST AND METHOD FOR MAKING

Vinod M. Jalan, Manchester, and Calvin L. Bushnell, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 23, 1977, Ser. No. 854,284

Int. Cl.[2] B01J *21/18, 23/42*

U.S. Cl. 429—44 **28 Claims**

20. A fuel cell electrode including an improved catalyst comprising platinum crystallites supported on carbon particles, said crystallites having porous carbon deposited thereon and therearound.

4,137,373

PLATINUM CATALYST AND METHOD FOR MAKING

Vinod M. Jalan, Manchester, and Calvin L. Bushnell, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 23, 1977, Ser. No. 854,285
Int. Cl.[2] B01J *21/18, 23/42*
U.S. Cl. 429—44 15 Claims

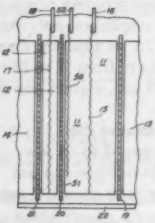
10. A fuel cell electrode including an improved catalyst comprising small platinum crystallites supported on carbon particles, said crystallites having porous carbon deposited thereon and therearound, said catalyst with said porous carbon deposits having been heated in an inert atmosphere or vacuum within the temperature range of 1500° F. to 2250° F., the temperature having been held within said range for one-half to six hours.

4,137,374

METHOD FOR STATE OF CHARGE OF PRIMARY BATTERY

David H. Fritts, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 844,162, Oct. 21, 1977. This application May 2, 1978, Ser. No. 902,133
Int. Cl.[2] H01M *10/44*
U.S. Cl. 429—50 1 Claim



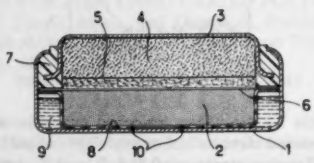
1. The method of ascertaining the state of charge of a porous electrode primary battery having a separator separating a porous carbon cathode and an anode, the said battery having a porous carbon cathode with a current collecting grid in the said porous carbon electrode and a voltage sensing grid positioned in the said porous carbon cathode near the surface of the cathode adjacent the said separator and having a connection tab, which comprises measuring the electrical voltage between the said sensing grid and the said current collecting grid.

4,137,375

BUTTON TYPE ELECTRIC CELLS

Daniel Coueille, Poitiers, France, assignor to Saft-Societe des Accumulateurs Fixes et de Traction, Romainville, France

Filed Jan. 16, 1978, Ser. No. 869,487
Claims priority, application France, Jan. 21, 1977, 77 01705
Int. Cl.[2] H01M *6/00*
U.S. Cl. 429—66 6 Claims



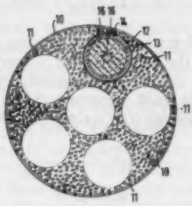
1. A button type electric cell comprising a first metal cup containing a positive active mass and serving as a current collector for the positive electrode of the cell, a second metal cup fitted together with the first metal cup in facing relation thereto and containing a negative active mass and acting as a current collector for the negative electrode of the cell, a separator impregnated with electrolyte between the positive and negative active masses, and an insulating seal at the joint between the two cups fitted together, the overall volume of the active masses being different in the charged state than in the discharged state, wherein the improvement comprises a perforated metal sheet in electrical contact with the first cup and having a portion thereof spaced from the inner wall of said first cup to form at least one compartment situated between said wall and the positive active mass, said compartment being filled with electrolyte when the active materials of the cell are in that state of charge in which they take up the maximum volume.

4,137,376

SODIUM SULPHUR BATTERIES COMPRISING A PLURALITY OF SEPARATE CELLS WITHIN A CONTAINER

Gordon A. Clegg, Rossendale, and David R. Lauder, Timperley, both of England, assignors to Chloride Silent Power Limited, London, England

Filed Oct. 31, 1977, Ser. No. 847,287
Claims priority, application United Kingdom, Nov. 8, 1976, 46471/76
Int. Cl.[2] H01M *10/39*
U.S. Cl. 429—104 17 Claims



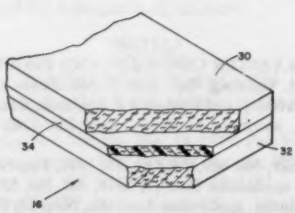
1. A sodium sulphur battery comprising a plurality of cells each having a container within which is a solid electrolyte separating sodium from a cathodic reactant, wherein the cells are formed into an assembly within an outer housing and wherein foamed carbon material is provided within the outer housing between the cells.

4,137,377

MAINTENANCE-FREE LEAD-ACID CELL

Donald H. McClelland, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Oct. 19, 1977, Ser. No. 843,470
Int. Cl.[2] H01M *2/14*
U.S. Cl. 429—145 2 Claims



1. In a rechargeable maintenance-free lead-acid cell having a positive plate, a negative plate, an acid electrolyte, and a porous multilayered highly absorbent thin separator disposed between and in contact with the plates, with the electrolyte

being substantially completely absorbed in the separator and plates, the combination of:

said porous multilayered electrolyte retaining separator including (1) at least one compressible layer of about 82–95 percent porosity microdiameter glass fibrous material compressed to intimately conform to the positive plate, and exhibiting glass weight variations from plus or minus 10 percent per unit area of the layer, and being compressed in the range from about 70 to about 95 percent of its uncompressed thickness, and having an average fiber diameter of less than about 0.65 microns with a surface area of from about 2 to about 8 square meters per gram of silica of the glass, (2) at least one such layer, as defined in "(1)", compressed to intimately conform to the negative plate, and (3) a substantially dimensionally stable microporous layer(s) positioned intermediate the layers of glass fibrous material and having, compared with the glass fibrous materials, a lesser thickness, and a resistivity from about 1.5 to about 5 times the resistivity of the glass; and

said electrolyte being of such limited proportion and distribution that the bulk of the electrolyte in the cell is contained within the pores of the multilayered separator yet the multilayered separator has a substantial electrolyte-free void volume therein.

4,137,378

CALCIUM-STRONTIUM-LEAD GRID ALLOY FOR USE IN LEAD-ACID BATTERIES

John Nees, Wyomissing, and Dale A. Bailey, Hamburg, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Filed May 31, 1977, Ser. No. 802,182

Int. Cl.² H01M *4/66*

U.S. Cl. 429—245 **2 Claims**

1. In a lead-acid storage battery having a plurality of grids disposed therein; the improvement wherein said grids comprise a lead alloy consisting essentially of about 0.04 wt-% calcium; about 0.04 wt-% strontium; 0.1 to 1.0 wt-% tin; trace impurities not exceeding 0.03 wt-%, with the remainder of said alloy being lead.

4,137,379

STORAGE BATTERY WITH SEPARATOR OF DUMBBELL-SHAPED FIBERS

Klaus Schmidt, Hirschberg; Harald Hoffmann, Mannheim, and Erich Fahrback, Weinheim, all of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Apr. 19, 1977, Ser. No. 788,869

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1976, 2618623

Int. Cl.² H01M *2/16*

U.S. Cl. 429—254 **3 Claims**

1. In a storage battery comprising a housing, a plurality of plates within said housing, an electrolyte within said housing about said plates, and a non-woven fabric separator between adjacent plates, the improvement which comprises employing as said separator a compressed web of synthetic fibers deposited in random arrangement and having an essentially dumbbell-shaped profile.

4,137,380

POLYESTER GRANULES AND PROCESS

Raymond H. Gunning, Box Hill North; Bruce C. Henshaw, Mount Waverley, and Frederick J. Lubbock, Beaumaris, all of Australia, assignors to Dulux Australia Ltd., Melbourne, Australia

Division of Ser. No. 409,454, Oct. 25, 1973, Pat. No. 3,879,314. This application Dec. 17, 1974, Ser. No. 535,711

Claims priority, application Australia, Nov. 13, 1972, PB1202

Int. Cl.² C08J *9/28*

U.S. Cl. 521—62 **7 Claims**

1. An aqueous slurry of vesiculated cross-linked polyester resin granules which are dimensionally stable in that the shrinkage of a water-wet granule on drying out and measuring by microscope examination is less than 5% and which have a vesicle volume of 65–80% of the total granule volume, the cross-linked polyester being the product of a carboxylated unsaturated polyester resin which has an acid value of 10-45 mgm KOH per gm cross-linked with ethylenically unsaturated monomer copolymerisable therewith and which has a solubility in water at 20° C of less than 5% by weight, said slurry also including a water-soluble polyamine which contains at least three amine groups per molecule and which has a dissociation constant in water (pKa value) of 8.5–10.5, at a concentration such that there are 0.3 to 1.4 amine groups present per polyester resin carboxyl group before said resin in crosslinked.

4,137,381

FINELY DISTRIBUTED POLYVINYL CHLORIDE MOLDING COMPOSITIONS CAPABLE OF BEING SINTERED

Helmut Kraus, Burghausen, Salzach; Heinz Müller, Burgkirchen, Alz; Hans Huber, Burgkirchen, Alz, and Kasimir Rychlak, Burgkirchen, Alz, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,809

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1976, 2646595

Int. Cl.² C08K *5/42*

U.S. Cl. 526—3 **8 Claims**

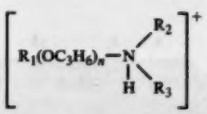
1. Finely distributed molding composition capable of being sintered made from suspension polyvinyl chloride having a K value of from 60 to 75, an apparent density of from 350 to 500 g/l, a plastifier uptake of from 12 to 25 weight %, a mean grain size of from 15 to 35 μm, a grain size distribution of from

60 to 98 weight % smaller than 33 μm
2 to 35 weight % from 33 to 63 μm
0 to 4.5 weight % from 63 to 125 μm
0 to 0.5 weight % greater than 125 μm,

prepared by suspension polymerization of vinyl chloride in aqueous phase by means of oil-soluble activators, in the presence of at least one suspension stabilizer and from 0.01 to 0.5 weight %, relative to monomer vinyl chloride, of at least one alkylarylsulfonic acid having from 3 to 16 carbon atoms in the alkyl chain, or of at least one alkylsulfonic acid having from 8 to 16 carbon atoms, or mixtures of the cited sulfonic acids, whereby a further amount of at least one of these sulfonic acids may be added to the polymer obtained after its separation from the polymerization mixture, wherein the molding composition comprises

(a) from 0.003 to 0.45 weight % (relative to the total molding composition) of at least one of the said sulfonic acids, and

(b) from 1/9 to 7/3 of the amount cited sub a) of at least one anion of the said sulfonic acids in the form of their salts with at least one organic cation having a total number of from 6 to 60 carbon atoms, and corresponding to the following formula



wherein R_1 is a linear, branched or cyclic, saturated or unsaturated alkyl radical or arylalkyl radical having from 6 to 22 carbon atoms; n is 0 or 1; R_2 and R_3, being identical or different, each are hydrogen, a linear, branched or cyclic, saturated or unsaturated alkyl or aralkyl radical having from 1 to 22 carbon atoms, a radical of the formula

$$-(CH_2CHO)_m-H,$$
$$\quad\quad|$$
$$\quad\quad X$$

wherein X is H or CH_3 and *m* an integer of from 1 to 20; or R_2 or R_3 is a radical of the formula $-C_3H_6O-R_1$, wherein R_1 is as defined above.

4,137,382

PROCESS FOR COPOLYMERIZING ETHYLENE, VINYL ACETATE AND CARBON MONOXIDE TO PROVIDE COPOLYMERS OF REDUCED MELT FLOW RATE

Clarence J. Vetter, Jr., Atwood, Ill., assignor to National Distillers and Chemical Corporation, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,762
Int. Cl.[2] C08G *67/02*
U.S. Cl. 528—271 **5 Claims**

1. A process for preparing a copolymer of ethylene, vinyl acetate and carbon monoxide which comprises introducing a copolymerizable mixture containing from about 15 to about 85 percent by weight ethylene, the balance being made up of vinyl acetate and not more than about 5 percent carbon monoxide by weight of the entire mixture, into a polymerization zone and copolymerizing said mixture at an elevated pressure and an average temperature within the range from about 170° F. to about 240° F.

4,137,383

PROCESS FOR STABILIZING CHLORINE-CONTAINING RESINS

Norio Sagane, Osaka; Minoru Kohara; Tomoo Shiohara, both of Kyoto, and Yasuhiko Araki, Osaka, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 29, 1975, Ser. No. 644,684
Claims priority, application Japan, Dec. 27, 1974, 49-3314
Int. Cl.[2] C08K *3/12, 3/28, 3/38*
U.S. Cl. 526—24 **4 Claims**

1. A process for stabilizing a chlorine-containing resin which comprises contacting a chlorine-containing resin selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, a vinyl-chloride-vinylidene chloride copolymer, a vinyl chloride-vinyl acetate copolymer, a vinyl chloride-ethylene copolymer, a chlorinated polyvinyl chloride and chlorinated polyethylene with a hydride gaseous at a temperature below the molding temperature of said resin for a period of time sufficient to stabilize the chlorine-containing resin.

4,137,384

ACCELERATOR FOR CURING CHLORINATED ETHYLENICALLY UNSATURATED POLYMERS

Anthony F. Finelli, Akron, and Thomas G. Hutchins, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 30, 1977, Ser. No. 855,645
Int. Cl.[2] C08F *8/30, 8/34, 8/42*
U.S. Cl. 526—35 **6 Claims**

1. A curable chlorinated ethylenically unsaturated polymer composition comprising a 100 parts by weight of a chlorinated ethylenically unsaturated polymer containing mixed therein a curable amount of a metal oxide selected from the class consisting of zinc oxide and magnesium oxide, and an accelerating amount of thioperimidone.

4,137,385

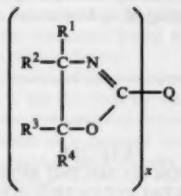
HYDROCURABLE COMPOSITIONS CONTAINING POLY-OXAZOLINE GROUPS

R. Larry Reitz, Salem, Conn.; Thomas W. Hutton, Doylestown, and Sheldon N. Lewis, Willow Grove, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 24, 1977, Ser. No. 809,887
Int. Cl.[2] C08F *8/30*
U.S. Cl. 526—50 **15 Claims**

1. A hydrocured, thermoset polymer comprising the reaction product of:

(A) a first poly-oxazoline compound represented by the formula



wherein:

(1) Q is a sigma bond or a divalent or trivalent organic radical having up to sixty carbon atoms which is a member of (a) the saturated straight-chain, branched-chain, and mono- and dicyclic aliphatic hydrocarbon group, or (b) the mono- and dicyclic aromatic hydrocarbon group, or (c) the group which comprises a combination of (a) and (b) above, wherein each of said radicals occurs, independently, as a substituent attached to a different carbon atom or to a single carbon atom of the hydrocarbon groups of (a) and (b) above;

(2) *x* is an integer having a value of from 2 to 20, wherein when Q is a sigma bond, *x* has a value of 2; and

(3) R^1, R^2, R^3 and R^4 are independently selected from the group of hydrogen and monovalent organic radicals which contain from 1 to 20 carbon atoms and which are unreactive towards carboxylic acid cyclic anhydrides; and

(B) A second compound comprising a polymer containing in the backbone thereof from about 2–70% by weight of compounds having units derived from addition polymerizable ethylenically unsaturated dicarboxylic acid cyclic anhydrides; and

(C) Water; wherein said first oxazoline compound and said second cyclic anhydride-containing compound are initially blended in a proportion such that the ratio of poly-oxazoline groups of said first compound to cyclic anhydride groups of said second compound is about 1:1, the blended compounds are heated to a temperature of from about 100° C. to about 250° C. thereby fusing the blended compounds, and said fused blended compounds are exposed to moisture by means of feeding water or steam into a high humidity oven at a temperature of about 110° C. up to 150° C. to effect said reaction, thereby effecting cross-linking of the compounds of the blend.

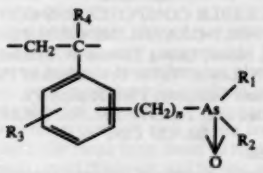
4,137,386

COMPOUNDS AND PROCESS

Curtis P. Smith, Cheshire, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 764,376, Jan. 31, 1977, Pat. No. 4,098,973. This application May 3, 1978, Ser. No. 902,489
Int. Cl.[2] C08F *8/22, 8/24, 8/42*
U.S. Cl. 260—551 CD **2 Claims**

1. In a process for the preparation of a carbodiimide by heating the appropriate organic isocyanate in the presence of a catalyst the improvement which comprises employing as said catalyst a polymer characterized by the presence therein of a recurring unit having the formula:



wherein n is 0 or 1, R_1 and R_2 each independently represents hydrocarbyl, said hydrocarbyl being free of substituents which are reactive with isocyanate, R_3 is selected from the class consisting of chlorine, methyl and hydrogen and R_4 is selected from the class consisting of hydrogen and methyl.

4,137,387

EQUIPMENT FOR HANDLING SPENT-AQUEOUS ZIEGLER TYPE CATALYST IN THE POLYMERIZATION OF OLEFINS

Constantine D. Miserlis, Arlington, and Peter J. Lewis, Andover, both of Mass., assignors to The Badger Company, Inc., Cambridge, Mass.

Filed Sep. 30, 1976, Ser. No. 728,155
Int. Cl.[2] C08F *6/28*
U.S. Cl. 526—62 **3 Claims**

1. A method of polymerizing olefins from liquid olefin monomer with a Ziegler type catalyst under positive pressure, in which the reaction mass comprises catalyst and polyolefin dissolved in liquid monomer and is mixed with water in a mixer to halt the reaction and in which the water with catalyst dissolved therein is separated from the reaction mass in a settling tank, and in which at least one of the mixer and settling tank comprises an outer shell the inner wall of which has a lining resistant to said aqueous solution of Ziegler catalyst and to said polyolefin-in-monomer solution, said lining comprising a layer of acid resistant bricks and an intermediate membrane between said layer of bricks and said inner wall, said bricks being mortared together and to said membrane and said membrane being cemented to said inner wall of said shell by a furan polymer cement and said membrane comprising a furan polymer.

4,137,388

POLYSTYRENE WITH DISTINCT MOIETIES OF MOLECULAR WEIGHT DISTRIBUTION

Louis A. Cutter, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 6, 1978, Ser. No. 867,394
Int. Cl.[2] C08F *2/18, 4/38, 112/08*
U.S. Cl. 526—73 **6 Claims**

1. Method of making polystyrene having a bimodal molecular weight distribution by suspension polymerization comprising (a) polymerizing 100 parts by weight styrene in the presence of at least about 0.05 parts low-temperature peroxide initiator and at a temperature of from 80° C. to 110° C. to the point where at least about 70% of the styrene monomer is polymerized, (b) thereafter adding to the polymerization mixture about 100 to about 300 parts additional styrene and continuing to conduct the polymerization reaction in the presence of a high-temperature initiator and at a temperature of from 80° C. to 150° C. until residual monomer is less than about 0.5% of the polystyrene product.

4,137,389

LOW-MOLECULAR WEIGHT ACRYLATE RESINS AND A PROCESS FOR THEIR PRODUCTION

Frank Wingler, Leverkusen; Josef Pedain, Cologne, and Walter Uerdingen, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

Filed Jan. 23, 1978, Ser. No. 871,248
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1977, 2703311
Int. Cl.[2] C08F *2/00, 4/38, 16/12*
U.S. Cl. 526—86 **2 Claims**

1. A process for the production of an acrylic resin, which comprises the radical bulk copolymerisation of

(A) 0 to 30 parts by weight of at least one hydroxyalkyl ester of acrylic acid or methacrylic acid with 2 to 4 carbon atoms in the hydroxyalkyl radical, or a mixture thereof;

(B) 0 to 60 parts by weight of styrene, α-methyl styrene, o-chlorostyrene, p-chlorostyrene, o-, m- or p-methyl styrene, p-tert.-butyl styrene or methyl methacrylate, or a mixture thereof;

(C) 10 to 90 parts by weight of at least one acrylic acid ester with 1 to 12 carbon atoms in the alcohol radical or of at least one methacrylic acid ester with 2 to 12 carbon atoms in the alcohol radical, or a mixture thereof;

(D) 0 to 30 parts by weight of at least one α,β-monoolefinically saturated mono- or di-carboxylic acid with 3 to 5 carbon atoms or of at least one maleic acid semiester with 2 to 14 carbon atoms in the alcohol radical, or a mixture thereof or a reaction product thereof with a monoglycidyl compound, in the presence of

(E) 10 to 70 parts by weight of at least one monoallyl ether of an at least trihydric alcohol, the sum of the parts by weight of all the monomers A–E amounting to 100, wherein the indicated quantity of monomer E is initially introduced and, at a temperature above 100° C., monomers A to D together with 0.5 to 6% by weight, based on A to D, of an initiator, are introduced over a period of 1 to 6 hours and polymerised, at least 98% by weight of the monomers A to D and from 36 to 95% by weight of monomer E being converted.

4,137,390

PROCESS FOR THE POLYMERIZATION OF CYCLOOLEFINS

Eilert A. Ofstead, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 7, 1977, Ser. No. 831,201
Int. Cl.[2] C08F *4/78, 32/04*
U.S. Cl. 526—143 **4 Claims**

1. A cycloolefin metathesis polymerization process comprising polymerizing at least one unsaturated alicyclic compound selected from the group consisting of (1) unsaturated alicyclic compounds containing five carbon atoms in the ring and one double bond in the ring and (2) non-conjugated, unsaturated alicyclic compounds containing at least seven carbon atoms in the ring and at least one double bond in the ring, by subjecting said alicyclic compounds or mixtures thereof to polymerization conditions in the presence of a catalyst system comprising (A) at least one transition metal salt selected from the group consisting of tungsten halides and tungsten oxyhalides, (B) at least one compound selected from the group consisting of alkylaluminum sesquihalides, alkylaluminum dihalides, dialkylaluminum halides and trialkylaluminums, (C) at least one hydroxy compound of the general formula ROH wherein R is selected from the group consisting of alkyl, cycloalkyl, alkoxyalkyl, aralkyl and aryl, and (D) pentachlorophenol or pentabromophenol, wherein the molar ratio of A:B:C:D lies within the range of 1:0.5–10:0.5–3:0.1–3 wherein aliphatic or cycloaliphatic hydrocarbons or mixtures thereof are employed as a polymerization solvent.

4,137,391
CONTINUOUS SOLUTION POLYMERIZATION OF A CONJUGATED DIENE WITH A MONOVINYLAROMATIC COMPOUND USING ALKOXYSILICON TREATING AGENTS IN THE FIRST REACTOR MEANS OF A REACTOR SERIES

Richard L. Smith, and Ralph C. Farrar, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 10, 1976, Ser. No. 722,253
Int. Cl.[2] C08F *4/48, 4/56, 4/58*
U.S. Cl. 526—178 23 Claims

1. A process for preparing a rubbery substantially random copolymer which comprises polymerizing monomers selected from at least one polymerizable conjugated diene with at least one copolymerizable monovinyl-substituted aromatic compound under solution polymerization conditions of temperature, pressure, diluent, an organolithium initiator, and at least one randomizing agent in an amount sufficient to substantially randomize the copolymerization of said conjugated diene and said monovinyl-substituted aromatic compound,

wherein said polymerization process is conducted as a substantially continuous polymerization process employing at least two reactor means of which the first and optionally at least one second reactor means function as polymerization reactor means and the last as a terminating reactor means, wherein said conjugated diene, said monovinylaromatic compound, said organolithium initiator, said randomizing agent, said diluent, and at least one alkoxysilicon treating agent, are added to said first reactor means to form a polymerization mixture, wherein said polymerization of said monomers is substantially complete when said polymerization mixture enters said terminating reactor means, and said random copolymer is withdrawn as product from said last reactor means, wherein said alkoxysilicon treating agent is employed in an amount effective to substantially increase the processability of said random copolymer product.

4,137,392
CARBOXYLATED VINYL PYRROLIDONE COPOLYMERS

Bill B. Gross, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 10, 1978, Ser. No. 868,258
Int. Cl.[2] C08F *212/08, 220/12, 226/10*
U.S. Cl. 526—224 8 Claims

1. A resin, suitable for use in a water reducible composition which comprises, based on 100 weight percent of monomeric units within the resin:

(A) from about 60 to about 75 percent of at least two acrylate monomers selected from the group consisting of methyl acrylate, ethyl acrylate, 2-ethylhexyl acrylate, lauryl acrylate, 2-ethylhexyl methacrylate, butyl acrylate, isodecyl methacrylate, butyl methacrylate, and isobutyl methacrylate;

(B) from about 20 to about 30 percent styrene

(C) from about 0.5 to about 5 percent N-vinyl-2-pyrrolidone; and

(D) from about 2 to about 15 percent of an organic acid selected from the group consisting of acrylic acid, and methacrylic acid.

7. A resin, suitable for use in a water reducible composition which comprises a copolymer consisting essentially of 71 percent isobutyl methacrylate, 24 percent 2-ethylhexyl methacrylate, 2 percent N-vinyl-2-pyrrolidone and 3 percent methacrylic acid.

4,137,393
POLYESTER POLYMER RECOVERY FROM DYED POLYESTER FIBERS

Norman C. Sidebotham, Gulf Breeze; Paul D. Shoemaker, and Clarence W. Young, III, both of Pensacola, all of Fla., assignors to Monsanto Company, Decatur, Ala.

Filed Apr. 7, 1977, Ser. No. 785,477
Int. Cl.[2] C08J *3/00;* C08G *63/16;* C08J *7/02*
U.S. Cl. 528—491 10 Claims

1. A process for recovery, in a form suitable for reuse in production, of polyester polymer from collections of polymeric materials comprising dyed polyester fibers comprising:

(1) stripping the dye from said dyed polyester fibers by contacting the collections with a dye-stripping solvent at a temperature below which the polyester dissolves and above which the crystalline lattice of the polyester fiber swells so as to release the dye;

(2) removing the excess of the dye-containing dye-stripping solvent which is not absorbed by the fabric;

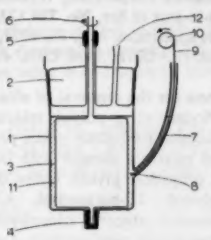
(3) contacting the dye-stripping solvent-laden fiber with sufficient addition of a primary dissolution solvent to dissolve the polyester fibers; thereby creating a dissolved polyester component;

(4) separating the residual dye-stripping solvent and the primary dissolution solvent from the polyester component by evaporation of the solvent without precipitating the polyester component from solution.

4,137,394
PROCESS FOR CONTINUOUS PREPARATION OF FIBROUS POLYMER CRYSTALS

Cornelis E. Meihuizen, Groningen; Albertus J. Pennings, Norg, and Arie Zwijnenburg, Groningen, all of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed May 17, 1977, Ser. No. 797,834
Claims priority, application Netherlands, May 20, 1976, 7605370
Int. Cl.[2] C08F *10/02, 6/06*
U.S. Cl. 528—502 17 Claims



1. A process for preparing continuous filament-like crystals of a crystallizable polymer comprising the steps of:

(a) providing a solution of a crystallizable polymer in a container therefor in contact with a rotating surface;

(b) rotating said solution while growing a seed crystal of said polymer in the flowing solution and allowing the seed crystal to grow longitudinally with respect to the direction of rotation of said polymer solution; and

(c) removing the thus grown polymer in the form of a continuous filament from the polymer solution at a rate substantially equal to the polymer crystal growth rate, wherein:

(i) the longitudinal growth takes place at the rotating surface which surface is moving in the direction of the growth of the crystal, and

(ii) at least about 15 cm of the filament-like crystal thus produced contacts said surface over a length of at least 15 cm thereof.

4,137,395
PROCESS FOR THE TWO-STAGE COMPOSITION OF THE HEMICELLULOSES OF XYLANE-CONTAINING NATURAL PRODUCTS FOR THE PURPOSE OF OBTAINING XYLOSE

Hans Buckl, Freising-Tümtenhausen, and Rudolf Fahn, Gammelsdorf, both of Germany, assignors to Süd-Chemie Aktiengesellschaft, Munich, Germany

Filed Nov. 22, 1976, Ser. No. 744,210
Claims priority, application Fed. Rep. of Germany, Nov. 28, 1975, 2553647
Int. Cl.[2] C07H *1/00, 1/08*
U.S. Cl. 536—1 **15 Claims**

1. In a process for the two-stage decomposition of the hemicelluloses of xylane-containing natural products for the purpose of obtaining xylose solutions, wherein the starting material is treated with an alkali hydroxide solution in the first stage and the obtained residue is subjected in the second stage to a dilute acid treatment, the improvement wherein the treated material is moved continuously in both stages in successive reactors by conveyor devices with different conveying performances, while

(a) in the first stage the starting material is brought into contact with an alkali hydroxide solution and the residue conveyed into a subsequent extraction zone is extracted with an extraction liquid, and

(b) in a second stage the extraction residue of the first stage is brought into contact with dilute acid and the residue conveyed into a subsequent extraction zone is extracted with another extraction liquid

and wherein in at least one of the alkali or the acid treatment, the starting material or the residue is preheated with steam to a temperature of about 100° to 150° C. and suddenly the alkali hydroxide solution, or the dilute acid, or one of the extraction liquids colder by about 10° to 60° C. is added.

4,137,396
FILTRATION PROCESS FOR PURIFYING POLYOLS

Joseph F. Louvar, Lincoln Park; Michael A. Capraro, Southgate, and William M. Herring, Trenton, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 726,122, Sep. 24, 1976, abandoned. This application Aug. 31, 1977, Ser. No. 829,436
Int. Cl.[2] C07H *3/06;* C07C *41/12*
U.S. Cl. 536—4 **8 Claims**

1. In the process for the removal of alkaline catalysts from crude polyoxyalkylene ether polyols selected from the group prepared by condensing ethylene oxide, propylene oxide, butylene oxide and mixtures thereof with compounds such as ethylene glycol, propylene glycol, water, dipropylene glycol, trimethylene glycol, 1,2-butanediol, 1,3-butanediol, 1,4-butanediol, hexanetriol, glycerol, trimethylolpropane, trimethylolethane, hydroquinone, pentaerythritol, alpha-methylglucoside, sorbitol, sucrose, ethylene diamine, diethylene triamine, toluene diamine, aniline, methylene dianiline, piperazine, triisopropanolamine and bisphenol A wherein said polyols have a molecular weight ranging from 300 to 26,000, prepared in a reactor the improvement comprising:

(a) stirring a mixture of water, synthetic magnesium silicate adsorbent, and said crude polyol at about 30° to about 120° C.,

(b) spray washing, with solvent selected from the group consisting of aliphatic alicyclic and aromatic hydrocarbons, dialkyl ketones, dialkyl ethers, halogenated hydrocarbons and mixtures thereof, the reactor employed for the preparation of said crude polyol,

(c) transferring said solvent to said mixture of step (a),

(d) cycling said mixture of step (c) through a filter until sufficient filter cake is deposited on said filter and a catalyst free filtrate containing said polyol is obtained,

(e) pumping a polyol filter heel through a catalyst scavenging system until a catalyst free polyol filter heel is obtained, and combining said catalyst free polyol filter heel with the polyol of step (d),

(f) washing said filter with said solvent,

(g) drying said filter cake, and

(h) removing said solvent and said water from said catalyst free polyol.

4,137,397
ERYTHROMYCIN ALDOBIONATES

Sadhan K. Dutta, and Sanat K. Basu, both of Calcutta, India, assignors to Registrar, Jadavpur University, Calcutta, India, a part interest

Filed Jun. 1, 1976, Ser. No. 691,833
Int. Cl.[2] C07C *17/08*
U.S. Cl. 536—9 **3 Claims**

1. Erythromycin Maltobionate.
2. Erythromycin Cellobionate.
3. Erythromycin Mellibionate.

4,137,398
PROCESS FOR THE REMOVAL OF CATALYST FROM POLYETHER POLYOL

John A. Muzzio, Taylor, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jun. 9, 1978, Ser. No. 914,024
Int. Cl.[2] C07C *3/00;* C07H *1/06;* C07C *41/12*
U.S. Cl. 536—4 **5 Claims**

1. In the process for purifying crude polyoxyalkylene ether polyols containing residual catalyst impurities, said polyols having a molecular weight range of 700 to about 26,000, the improvement which comprises:

(a) adding a synthetic magnesium silicate adsorbent and water forming a mixture with said crude polyol wherein the amount of adsorbent is from about 0.3 to 3.0 weight percent based on the weight of the polyol and the amount of water is from about 2.0 to 4.0 weight percent based on the weight of the polyol,

(b) heating said mixture at a temperature range from about 80° Centigrade to about 130° Centigrade for at least 45 minutes,

(c) adding from 0.1 to 0.3 percent, based on the weight of polyol of magnesium carbonate to the mixture during the latter portion of the heating step and at least 15 minutes prior to the end thereof,

(d) adding sufficient carbon dioxide to saturate the water at least 15 minutes after the magnesium carbonate is added and at least 15 minutes prior to filtration, and

(e) separating the polyol from the adsorbent by filtration at a temperature from about 90° C. to about 120° C. wherein the residual catalyst impurities are retained on the adsorbent.

4,137,399
METHOD OF PREPARING FUNCTIONALIZED CELLULOSES

Hans L. Hülsmann, Wetter, and Gustav Renckhoff, Witten, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Bezirk Cologne, Germany

Filed Sep. 30, 1977, Ser. No. 838,432
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1976, 2644678
Int. Cl.[2] C08B *3/00, 3/14, 11/00, 15/06*
U.S. Cl. 536—32 **8 Claims**

1. In the production of cellulose substituted by a group having a functional moiety or moieties capable of forming respectively a bond or bonds, wherein cellulose is contacted with an at least bifunctional reagent for reaction of a hydroxy group of the cellulose with the bifunctional reagent to form said substituted cellulose, the improvement which comprises contacting the reagent with cellulose dissolved in dimethylsulfoxide containing polyhydroxymethylene for said reaction of the cellulose and reagent to form said substituted cellulose.

4,137,400

POLYGALACTOMANNAN ETHER COMPOSITIONS

Ronald N. DeMartino, Wayne, and Anthony B. Conciatori, Chatham, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 763,372, Jan. 28, 1977. This application Jul. 8, 1977, Ser. No. 813,855

Int. Cl.[2] C08B *37/00*; C07G *17/00*

U.S. Cl. 536—114 **4 Claims**

1. N,N-dialkylacrylamide ether adduct of polygalactomannan gum having a degree of substitution between about 0.01 and 3.0, wherein each alkyl group contains between one and about four carbon atoms.

4,137,401

GLYCOSIDE-ETHER-ESTER COMPOUNDS

Raymond U. Lemieux, Edmonton; David R. Bundle, Ottawa, and Donald A. Baker, Edmonton, all of Canada, assignors to Chembiomed Limited, Edmonton, Canada

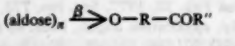
Filed Jun. 21, 1976, Ser. No. 698,548

Claims priority, application United Kingdom, Jul. 8, 1975, 28729/75

Int. Cl.[2] C07H *13/06*

U.S. Cl. 536—116 **8 Claims**

1. An O-β-glycoside having the general structure



wherein R is an aliphatic hydrocarbon moiety having 3 to 17 carbon atoms and R" is —H, —OH, —NH_2, —$NHNH_2$, —N_3, or lower alkoxy, and n has a value of 1 to 4.

4,137,402

QUATERNARY AMMONIUM SALTS OF DANTROLENE AND CLODANOLENE

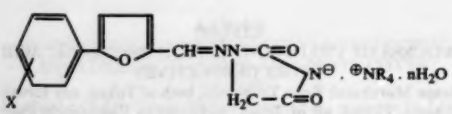
Ralph L. White, Jr., and George C. Wright, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 30, 1978, Ser. No. 891,521

Int. Cl.[2] C07D *405/14, 405/12*

U.S. Cl. 542—420 **8 Claims**

1. A compound of the formula:



wherein X is 4-nitro or 3,4-dichloro; $\oplus NR_4$ is N-methylpyridinium, 3,7-diamino-2,8-dimethyl-5-phenylphenazinium, 2,3-dimethyl-1-phenyl-4-trimethylammonium-3-pyrazoline-5-one, 1,3-dimethylimidazolium, choline, or 2-methyl-2-trimethylammonium-1-propanol; and n is 0, 0.75 or 1.5.

4,137,403

9-DEOXY-9-METHYLENE-PGF$_2$ CYCLOAMIDES

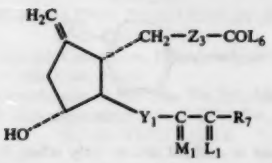
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 786,250, Apr. 11, 1977, Pat. No. 4,098,805. This application Apr. 24, 1978, Ser. No. 899,663

Int. Cl.[2] C07C *177/00*

U.S. Cl. 542—426 **88 Claims**

1. A prostaglandin analog of the formula

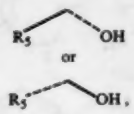


wherein

Y_1 is trans—CH=CH—, —C≡C-, or —CH_2CH_2—;

wherein

M_1 is

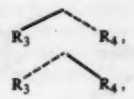


wherein

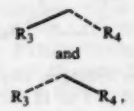
R_5 is hydrogen or methyl;

wherein

L_2 is



or a mixture of



wherein

R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;

wherein

Z_3 is

(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,

(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—, or

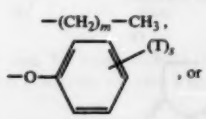
(3) cis—CH_2—CH=CH-$(CH_2)_g$—CH_2—,

wherein

g is one, 2, or 3;

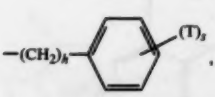
wherein

R_7 is



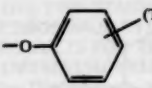
(1)

(2)



(3)

wherein m is one to 5, inclusive, h is zero or one, T is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, and s is zero, one, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is

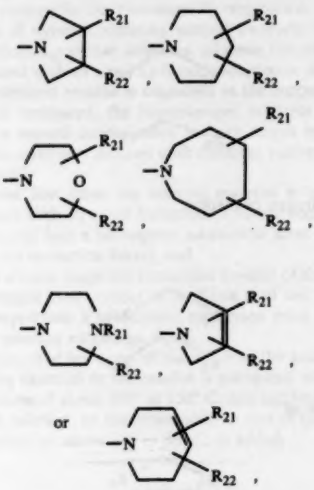


wherein

T and s are as defined above, only when R_3 and R_4 are hydrogen or methyl, being the same or different; and

wherein

L_6 is cycloamino of the formula



wherein R_{21} and R_{22} are hydrogen, alkyl of one to 12 carbon atoms, inclusive; aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 chloro or alkyl of one to 3 carbon atoms, inclusive, or phenyl substituted with hydroxycarbonyl or alkoxycarbonyl of one to 4 carbon atoms, inclusive.

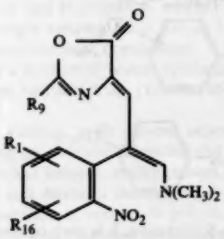
4,137,404

SYNTHESIS OF TRYPTOPHANS

Andrew D. Batcho, North Caldwell, and Willy Leimgruber, Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Dec. 20, 1977, Ser. No. 862,304
Int. Cl.[2] C07D *263/18*
U.S. Cl. 542—442 **3 Claims**

1. A compound of the formula:



V

wherein R_1 and R_{16} individually are halogen, lower alkyl, hydroxy, lower alkoxy, aralkyloxy, amino, trihalomethyl or hydrogen and R_9 is lower alkyl, aryl, hydrogen or halo-lower alkyl.

4,137,405

ISOLATION OF ANTIBIOTIC CEPHAMYCIN C

George T. Wildman, Westfield, and Rathin Datta, Princeton, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jul. 28, 1977, Ser. No. 819,810
Int. Cl.[2] C07D *501/12*
U.S. Cl. 544—20 **6 Claims**

1. A process for recovering the antibiotic Cephamycin C from fermentation broths or solutions containing said antibiotic wherein ion exchangers are utilized, the improvement being utilizing a water insoluble quarternary ammonium liquid anion exchanger dissolved in an organic solvent having a dielectric constant from about 4 to about 24.

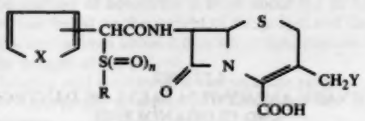
4,137,406

CEPHALOSPORINS HAVING A SULFUR CONTAINING FUNCTIONAL GROUP IN THE 7-POSITION SIDE CHAIN

Genichi Tsuchihashi, Tama; Katsuyuki Ogura; Masao Yaso, both of Sagamihara; Masashi Kuramoto, Shizuoka; Tadashiro Fujii, Mishima, and Tetsuo Watanabe, Yokohama, all of Japan, assignors to Sagami Chemical Research Center and Toyo Jozo Co., Ltd., both of, Japan

Filed Feb. 28, 1977, Ser. No. 773,113
Claims priority, application Japan, Mar. 4, 1976, 51-23522
Int. Cl.[2] C07D *501/56, 501/46, 501/34;* A61K *31/545*
U.S. Cl. 544—27 **2 Claims**

1. A compound of the formula:



wherein R equals methyl, X equals O or S, Y equals 1-methyl-1-H-tetrazol-5-ylthio and n equals 0 to 2.

4,137,407

PROCESS OF PREPARING CEPHALOSPORANIC ACID ESTER DERIVATIVES

Masuo Murakami; Kozo Takahashi, both of Tokyo, and Teruaki Ozasa, Urawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 577,702, May 15, 1975, abandoned, which is a division of Ser. No. 499,374, Mar. 8, 1974, Pat. No. 3,953,437. This application Mar. 9, 1977, Ser. No. 775,841
Claims priority, application Japan, Mar. 14, 1973, 48-29703
Int. Cl.[2] C07D *501/04*
U.S. Cl. 544—28 **1 Claim**

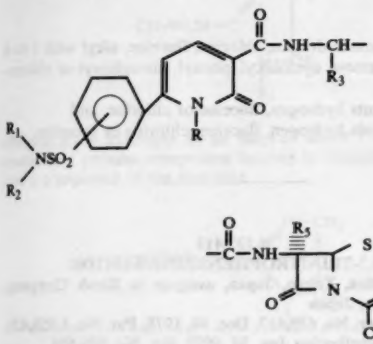
1. A process of preparing benzhydryl 3-methyl-7-(2,2-dimethyl-3-nitroso-4-phenyl-5-oxo-1-imidazolidinyl)-Δ^3-cepham-4-carboxylate, comprising the steps of adding to a mixture of benzhydryl 3-hydroxy-3-methyl-7-(2,2-dimethyl-3-nitroso-4-phenyl-5-oxo-1-imidazolidinyl)-cepham-4-carboxylate sulfoxide, in an inert organic solvent, under ice-cooling, about 0.4 weight part amounts with respect to the aforesaid cepham sulfoxide compound of thionyl chloride and about three molar amounts with respect to said thionyl chloride of pyridine base and recovering the desired Δ^3-cephalosporanic acid ester product.

4,137,408
[AMINO SULFONYL-2-OXO-NICOTINYL]DERIVATIVES OF CEPHALOSPORIN

James S. Kaltenbronn; Theodore H. Haskell, both of Ann Arbor, Mich., and Leonard Doub, Tucson, Ariz., assignors to Warner-Lambert, Morris Plains, N.J.

Division of Ser. No. 803,004, Jun. 3, 1977, Pat. No. 4,101,661. This application Oct. 27, 1977, Ser. No. 845,996
Int. Cl.[2] C07D *501/34*
U.S. Cl. 544—28 5 Claims

1. A compound of the formula



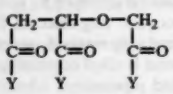
and pharmaceutically-acceptable salts thereof; wherein R is hydrogen or methyl; R_1 is hydrogen, lower alkyl or hydroxy(lower alkyl), R_2 is hydrogen, lower alkyl, hydroxy(lower alkyl), pyridyl or di(lower alkyl)amino(lower alkyl); R_1R_2N taken together is 1-pyrrolidinyl, 1-piperidnyl or hydroxymethyl-1-piperidinyl R_3 is phenyl, 4-hydroxyphenyl, 2-thienyl or cyclohexa-1,4-dien-1-yl; R_4 is hydrogen, acetoxy or 1-pyridyl and R_5 is hydrogen or methoxy, with the proviso that when R_4 is 1-pyridyl, the CO_2H is CO_2^-.

4,137,409
MORPHOLINO CARBOXYMETHYLOXYSUCCINIC ANHYDRIDES, HALIDES AND DERIVATIVES THEREOF

Vincent Lamberti, Upper Saddle River, N.J., assignor to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 797,226, May 16, 1977, Pat. No. 4,093,634. This application Apr. 4, 1978, Ser. No. 893,374
Int. Cl.[2] C07D *795/16*
U.S. Cl. 544—86 1 Claim

1. A mixture of amido ether polycarboxyl compounds of the general formula:



wherein Y is independently NH_2, —NRR′, or OM_1, and at least one Y is always OM_1; wherein R is an alkyl group containing 6 to 22 carbon atoms or an alkyl group R_2OH wherein R_2 contains 2 to 4 carbon atoms; and wherein R′ is H or R as defined above and wherein M_1 is a morpholinium cation.

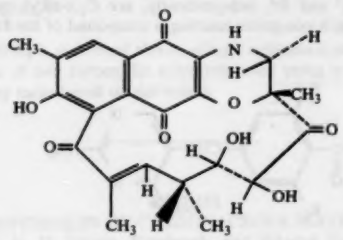
4,137,410
NOVEL DEGRADATION PRODUCTS OF RUBRADIRIN AND RUBRADIRIN B

Herman Hoeksema, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 793,785, May 5, 1977, abandoned. This application Feb. 6, 1978, Ser. No. 874,767
Int. Cl.[2] C07D *265/28*
U.S. Cl. 544—101 4 Claims

1. A compound which can be shown by the following structural formula:

III



and its base salts.

2. Acylates of the compound defined in claim 1 wherein said acyl group consists of a hydrocarbon carboxylic acid acyl of from 2 to 18 carbon atoms, inclusive; halo-, nitro-, hydroxy-, amino-, cyano-, thiocyano-, and lower alkoxy-substituted hydrocarbon carboxylic acid acyl of from 2 to 18 carbon atoms, inclusive.

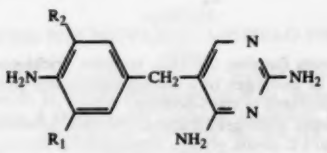
4,137,411
PREPARATION OF 2,4-DIAMINO-5-(4-AMINO-3,5-SUBSTITUTED-BENZYL)-PYRIMIDINES

Ivan Kompis, Oberwil, and Alexander E. Wick, Riehen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 1, 1978, Ser. No. 874,133
Claims priority, application Switzerland, Feb. 4, 1977, 1383/77
Int. Cl.[2] C07D *239/48*
U.S. Cl. 544—325 8 Claims

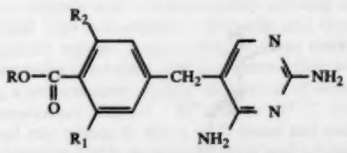
1. A process for the preparation of a benzylpyrimidine of the formula

(I)



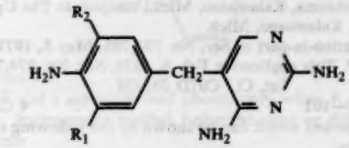
wherein R^1 and R^2 independently are C_{1-3}-alkyl or C_{1-3}-alkoxy, which comprises reacting a compound of the formula

II



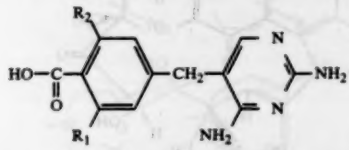
wherein R^1 and R^2 are as above and R is hydrogen or lower alkyl, with hydroxylamine or a salt thereof in polyphosphoric acid.

2. A process for the preparation of a benzylpyrimidine of the formula



(I)

wherein R^1 and R^2, independently, are C_{1-3}-alkyl or C_{1-3}-alkoxy, which comprises reacting a compound of the formula



(III)

wherein R^1 and R^2 are as above, with sodium azide in polyphosphoric acid.

4,137,412

PROCESS FOR THE PREPARATION OF SUBSTITUTED CHLOROPYRIMIDINES

Rudolf Braden, and Kurt Findeisen, both of Odenthal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

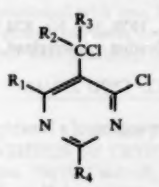
Filed Dec. 13, 1977, Ser. No. 860,272

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1976, 2659694

Int. Cl.² C07D *239/02*

U.S. Cl. 544—334 **13 Claims**

1. A process for the preparation of a chlorinated pyrimidine, chloroalkyl-substituted in the 5-position of the formula



(I)

wherein

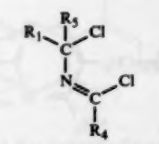
R_1 represents fluorine, chlorine, bromine, trichloromethyl, phenyl or hydrogen or a second chlorinated pyrimidine ring substituted in the 5-position,

R_2 represents hydrogen, fluorine, chlorine, bromine, alkyl with 1 to 6 C atoms, phenyl, nitrophenyl or chlorophenyl,

R_3 represents hydrogen, fluorine, bromine or chlorine and

R_4 represents fluorine, chlorine, bromine, trichloromethyl or hydrogen,

which comprises contacting a halogeno-azaalkene of the formula



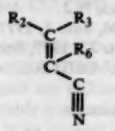
(II)

wherein

R_1 represents fluorine, chlorine, bromine, trichloromethyl, phenyl, hydrogen or $—CCl_2—N=CCl_2$;

R_4 represents fluorine, chlorine, bromine or trichloromethyl; and

R_5 represents fluorine, chlorine, bromine or hydrogen with an α,β-unsaturated nitrile of the formula



(III)

wherein

R_2 represents hydrogen, chlorine, fluorine, alkyl with 1 to 6 carbon atoms, cycloalkyl, phenyl, nitrophenyl or chlorophenyl;

R_3 represents hydrogen, fluorine or chlorine, and

R_6 represents hydrogen, fluorine, chlorine or bromine.

4,137,413

1,3,7-TRINITROPHENAZINE-5-OXIDE

Masafumi Ohta, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Division of Ser. No. 639,417, Dec. 10, 1975, Pat. No. 4,055,421. This application Jun. 24, 1977, Ser. No. 809,696

Claims priority, application Japan, Dec. 12, 1974, 49-142736

Int. Cl.² C07D *51/80*

U.S. Cl. 544—348 **1 Claim**

1. 1,3,7-trinitrophenazine-5-oxide.

4,137,414

5-SUBSTITUTED-2-PHENYLBENZO[b]THIOPHENE-3-ALKYLAMINES AND RELATED COMPOUNDS

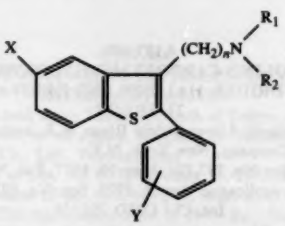
Michael J. Kukla, Skokie, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Sep. 26, 1977, Ser. No. 836,868

Int. Cl.² C07D *333/58, 409/06*

U.S. Cl. 544—376 **21 Claims**

1. A compound of the formula



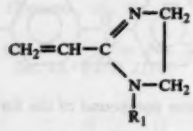
and the pharmaceutically acceptable acid addition salts wherein R_1 and R_2 each independently represents H or alkyl having from 1 to 8 carbon atoms or R_1 and R_2 together with N reresent an azamonocyclic ring selected from the group consisting of pyrrolidinyl, piperazinyl, substituted pyrrolidinyl wherein the substituent is alkyl containing from 1 to 4 carbon atoms and substituted piperazinyl wherein the substituent is alkyl containing from 1 to 4 carbon atoms or hydroxy alkyl wherein the alkyl moiety contains 1 to 4 carbon atoms; Y represents H, halogen or alkyl having 1 to 4 carbon atoms; X represents H, halogen, alkyl having 1 to 4 carbon atoms and alkoxy wherein the alkyl moiety contains 1 to 4 carbon atoms; and n is a positive integer from 1 to 4.

4,137,415
PROCESS FOR PREPARATION OF 2-VINYLIMIDAZOLINES

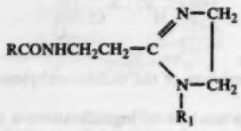
Hans P. Panzer, Stamford, and Kenny U. Acholonu, Bridgeport, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1978, Ser. No. 867,255
Int. Cl.[2] C07D 233/06
U.S. Cl. 548—347 5 Claims

1. A process for preparing compounds of the structure:



wherein R_1 is hydrogen or an alkyl of about 1 to 5 carbon atoms, said process comprising heating to cracking temperature a compound of the structure



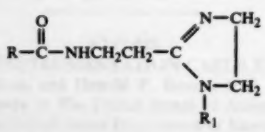
wherein R is an alkyl group of about 1 to 5 carbon atoms and R_1 is hydrogen or an alkyl group of about 1 to 5 carbon atoms distilling the cleavage products, and recovering the desired compound from the distillate.

4,137,416
2-ACYLAMIDOETHYL-2-IMIDAZOLINES

Hans P. Panzer, Stamford, and Kenny U. Acholonu, Bridgeport, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1978, Ser. No. 867,252
Int. Cl.[2] C07D 233/26
U.S. Cl. 548—353 5 Claims

1. A compound of the structure



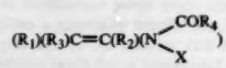
wherein R is an alkyl group of about 1 to 5 carbon atoms and R_1 is hydrogen or alkyl of about 1 to 5 carbon atoms.

4,137,417
PROCESS FOR PRODUCING AN ENAMIDE

Motoo Hazama, Kyoto, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

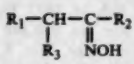
Filed Apr. 26, 1977, Ser. No. 790,908
Claims priority, application Japan, Apr. 30, 1976, 51-50537
Int. Cl.[2] C07C 102/00, 67/00
U.S. Cl. 560—250 5 Claims

1. A process for the production of an enamide of the formula (I),



(I)

where R_1 and R_2 independently are hydrogen, alkyl or aryl or R_1 and R_2 together are cycloalkyl, R_3 is — $OCOR_5$, R_5 is alkyl, aralkyl or aryl, X hydrogen or — COR_4 and R_4 is alkyl or aryl, which comprises hydrogenating an oxime having at least one hydrogen atom at the α-position represented by the formula (II),



(II)

wherein R_1, R_2 and R_3 are as defined above, in the presence of a carboxylic anhydride of the formula (III).

(III)

wherein R_4 is as defined above, using a ruthenium catalyst, the amount of said carboxylic anhydride used being at least two times by mole based on the oxime.

4,137,418
CONVERSION OF CARBONACEOUS MATERIAL

Johann G. D. Schulz, Pittsburgh, and Edward T. Sabourin, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 696,752, Jun. 16, 1976, Pat. No. 4,052,448. This application Jul. 5, 1977, Ser. No. 814,217
Int. Cl.[2] C07C 51/16
U.S. Cl. 562—407 5 Claims

1. A process for converting a carbonaceous material selected from the group consisting of coal and lignite to a mixture of polycyclic aromatic polycarboxylic acids that is substantially soluble in acetone and soluble in water which comprises subjecting an aqueous slurry containing said carbonaceous material to reaction with aqueous nitric acid, wherein the nitric acid has a concentration of about 5 to about 90 percent and the reaction is carried out at a temperature of about 15° to about 200° C. for about 0.5 to about 15 hours, separating the solids in the resulting slurry by filtration, separating nitric acid and water from the resulting filtrate by distillation and then extracting the remainder of said filtrate with a polar solvent to obtain said mixture of polycyclic aromatic polycarboxylic acids.

4,137,419
PROCESS FOR PREPARING 4-NITRO-O-PHTHALIC ACID

John D. Bacha; Anatoli Onopchenko, both of Monroeville, and Johann G. D. Schulz, Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jul. 11, 1977, Ser. No. 814,213
Int. Cl.[2] C07C 51/24
U.S. Cl. 562—408 13 Claims

1. A process for converting an organic compound selected from the group consisting of (1) an indene, (2) a polyindene, (3) a dihydronaphthalene and (4) a polydihydronaphthalene to 4-nitro-o-phthalic acid which comprises nitrating said organic compound with concentrated nitric acid and then oxidizing said nitrated organic compound with dilute nitric acid, said nitration being conducted with an aqueous nitric acid solution having a concentration of about 70 to about 95 weight per cent at a temperature of about −40° to about 90° C. over a period of about one minute to about eight hours and said oxidation being conducted with an aqueous nitric acid solution having a concentration of about five to about 50 weight per cent at a temperature of about 135° to about 210° C. for about 0.1 to about 10 hours.

4,137,420

CYSTEINE DERIVATIVES

Tadashi Fujita, Sakai; Masayuki Oya, Osaka; Hideo Takashina, Kobe, and Tadashi Iso, Tondabayashi, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

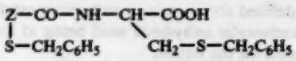
Division of Ser. No. 771,743, Feb. 24, 1977. This application Feb. 23, 1978, Ser. No. 880,348

Claims priority, application Japan, Mar. 8, 1976, 51-25455

Int. Cl.[2] C07C *149/42, 149/40, 149/243;* A61K *31/195*

U.S. Cl. 562—426 **5 Claims**

1. N-(benzylmercaptoacyl)-S-benzylcysteine represented by the formula (IV) wherein Z is selected from the group consisting of $CH_3—CH<$, $(CH_3)_2C<$, $(CH_2)_2<$ and $CH_2<$.



(IV)

4,137,421

PURIFICATION OF DICHLOROETHYLENE COMPOUND

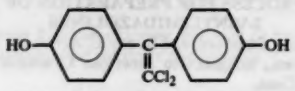
Ming K. Li, Schenectady, and Michael R. MacLaury, Rexford, both of N.N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 21, 1978, Ser. No. 879,083

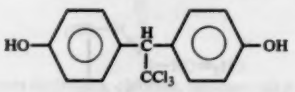
Int. Cl.[2] C07C *37/24*

U.S. Cl. 568—725 **6 Claims**

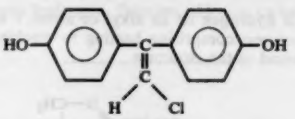
1. The process for purifying a dichloroethylene compound of the formula



containing as impurities therein a trichloro-ethane compound of formula



and a dichloroethylene compound of the formula



which comprises

(a) forming a mixture of the dichloroethylene compound in phenol,

(b) heating the mixture of ingredients to a temperature at which the dichloroethylene compound is substantially dissolved,

(c) cooling the mixture to a temperature at which crystals of dichloroethylene compound are produced, and

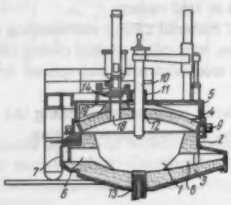
(d) removing the crystalline dichloroethylene compound of increased purity.

4,137,422

AIRTIGHT METAL MELTING FURNACE

Oleg A. Barbashin, ulitsa Rodionova, 188, kv. 25; Alexandr A. Okunev, bulvar Jubileiny, 3, kv. 64, both of, Gorky; Sergei K. Mikhailov, Avtovskaya ulitsa, 2, kv. 116, Leningrad; Lev E. Mochalov, ulitsa L. Tolstogo, 74, Gorky; Lev P. Orlov, ulitsa Kultury, 16, kv. 7, Gorky; Lev B. Shenderov, ulitsa Kultury, 10, kv. 35, Gorky; Nikolai S. Shelepov, ulitsa Geroev Kosmosa, 2a, kv. 96, Gorky; Vissarion M. Dubodin, 2 Mokhovoi proezd, 24, kv. 7, Gorky; Alexandr S. Vladimirov, ulitsa Vasiliay Kozhinoi, 8, korpus 1, kv. 12, Moscow, and Igor V. Gorynin, ulitsa Gromova, 16, kv. 50, Leningrad, all of U.S.S.R.

Filed Apr. 19, 1977, Ser. No. 788,790
Int. Cl.[2] F27D *21/00*
U.S. Cl. 13—9 R 12 Claims



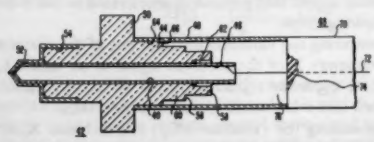
1. An airtight metal melting furnace, comprising a lined metal encasing shell; a refractory roof arranged above said shell, defining therewith a melting chamber and having a metal cover, said lined metal encasing shell being provided with a working port for deslagging and repair of the furnace slopes and with a discharge port for pouring metal from the melting chamber, a channel being formed in said roof and said cover; at least one upper electrode introduced into said melting chamber through an opening in the roof and the cover; a hearth electrode with said upper electrode producing a plasma or electric arc; a gate cutting off said channel; a table mounted above said roof cover for plane-parallel movement and fitted with slots; process means operable for measuring temperature of molten metal, for drawing samples of said molten metal and for introducing additives into said molten metal, fixed in said slots of said table and arranged alternately above said channel on said table; a seal providing tight joining of said channel with the process means being brought in alignment with said channel.

4,137,423

NUCLEAR INSTRUMENTATION CABLE END SEAL

Collins P. Cannon, and Donald P. Brown, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 16, 1977, Ser. No. 861,132
Int. Cl.[2] H02G *15/22*
U.S. Cl. 174—19 7 Claims



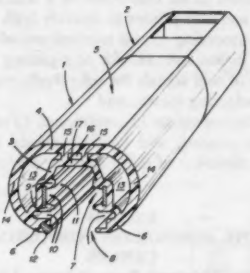
1. A high voltage, high temperature coaxial end seal for hermetically sealed nuclear instrumentation cable which exhibits an improved breakdown pulse noise characteristic, which end seal comprises a generally tubular insulator body portion with selected portions of the interior and exterior surfaces of the tubular insulator body being metallized, a conductive central tube passing through the tubular insulator and sealed thereto, an outer conductive sheath disposed about one end of the tubular insulator and sealed thereto, with a conductive end cap disposed about the other end of the tubular insulator and sealed to the metallized exterior surface of the tubular insulator and the conductive central tube, and wherein the other end surface of the tubular insulator body has a first radial surface portion of a predetermined minimum dimension extending from the tubular insulator body interior surface to an axial surface portion coaxial about the conductive central tube, with a second radial surface portion extending from the axial surface portion to the tubular insulator body exterior surface, with the radial and axial surface portions free of metallized layer, and wherein sealing braze material is provided between the conductive central tube and the metallized interior surface of the tubular insulator body with the braze material terminating along the first radial surface portion.

4,137,424

RAIL FOR SUPPORTING ELECTRICAL FIXTURES

Kurt Hesse; Karl Wehling, and Alfred Staff, all of Lemgo, Fed. Rep. of Germany, assignors to Staff KG, Lemgo, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,732
Claims priority, application Fed. Rep. of Germany, Apr. 26, 1976, 7612998[U]
Int. Cl.[2] H02G *5/04, 3/04;* B60M *1/34;* H01R *9/00*
U.S. Cl. 174—97 3 Claims



1. A supporting rail for supporting electrical fixtures of the like comprising:

an extruded plastic elongate member formed at least in part by spaced inner and outer walls which are joined at spaced locations about the cross-sectional periphery of said member,

siad inner wall enclosing an elongate inner chamber having an opening along its entire length,

said outer wall being of generally C-shaped cross-section and including a flattened surface portion opposite the opening in said inner chamber,

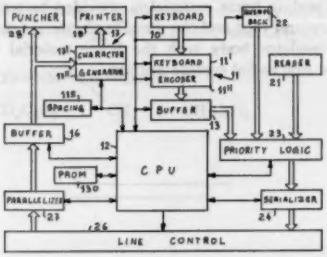
said spaced walls defining therebetween longitudinally extending hollow channels extending substantially about said periphery of said member, with said outer wall merging with said inner wall adjacent the opening in said inner chamber,

said inner wall forming at least one elongate recess and at least one elongate projection over the length of said member for supporting electrical conductors and connecting elements of fixtures intended to be suspended from said member.

4,137,425
BIALPHABETIC TELEPRINTER FOR TEXTS IN LATIN AND ARABIC CHARACTERS

Luigino Ferroglio, Ivrea, and Umberto Ratti, Turin, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Filed Oct. 18, 1977, Ser. No. 843,280
Claims priority, application Italy, Nov. 3, 1976, 69632 A/76
Int. Cl.[2] B41J 5/00; G06K 15/02; H04L 15/24
U.S. Cl. 178—30 17 Claims



1. A bialphabetic teleprinter for texts in alphabets of latin and arabic characters, including an alphanumeric keyboard **10** selectively conditionable for setting up texts in both said alphabets, signal generating means **11** for generating signals corresponding to characters and machine functions, a printer **18** controlled by said signals for printing selectively in either of said two alphabets, and letter spacing means **115** for letter spacing said printer from left to right when printing in latin alphabet and from right to left when printing in arabic alphabet, wherein the improvement includes:

alphabet selecting means **116**, **148** conditionable to cause the said keyboard to set characters in a selected one of said alphabets and said printer to operate both in sending and receiving according to said selected one of said alphabets,

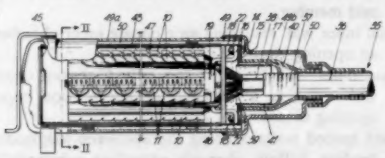
recognizing means **144**, **147** for recognizing predetermined sequences of said signals for selectively conditioning said alphabet selecting means, and

direction selecting means **12** conditioned by said recognizing means for causing said spacing means to accordingly select the direction of letter spacing movement.

4,137,426
LOADING COIL ASSEMBLIES FOR COMMUNICATION CABLES

Eric J. Crompton, Montreal; Serge Poissant, Laprairie, and Ian Fordyce, Roxboro, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Jun. 6, 1977, Ser. No. 803,470
Int. Cl.[2] H01F 17/08, 17/30
U.S. Cl. 178—46 14 Claims



1. A loading coil assembly, comprising:

a cylindrical casing having first and second end discs, the first end disc at an inlet end of the casing and the second end disc closing the end of the casing remote from said inlet end;

an inlet tube attached to said first end disc and extending axially from said casing, said inlet tube aligned with an aperture in said first end disc;

a support bracket mounted on said first end disc within said casing and extending diametrically across said casing;

a central column member attached at one end to said support bracket and extending axially from said support bracket coaxial with the longitudinal axis of the casing;

a flat support member mounted on the other end of said central column member, said support member including a series of apertures spaced around its periphery;

a plurality of assembled loading coil magazines in said casing, said magazines extending axially and spaced around said central column member;

suspension means at one end of each magazine, said suspension means inserted into said apertures in said support member;

expanded synthetic resin electrically insulating material filling spaces in said casing;

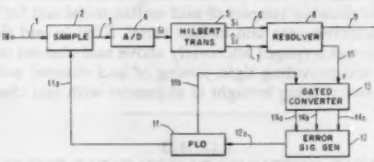
an outer plastic material casing surrounding said casing and said inlet tube, said outer plastic casing closed at the end remote from said inlet tube and spaced from said casing; and

expanded synthetic resin material filling the space between the casing and the outer plastic casing.

4,137,427
SYNCHRONIZING DEVICE FOR THE RECEIVER CLOCK OF A DATA TRANSMISSION SYSTEM USING PSK MODULATION

Michel Choquet, Vence; Daniel Pilost, and André Vadé, both of St-Laurent-du-Var, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 5, 1977, Ser. No. 812,971
Claims priority, application France, Jul. 9, 1976, 76 21564
Int. Cl.[2] H04L 7/00
U.S. Cl. 178—69.1 13 Claims



1. A synchronizing process for adjusting the relative phase of a receiver clock whose output signals define the signaling instants of the signal received by the receiver of a synchronous digital data transmission system using PSK modulation, said process enabling the signaling instants to be the same relative to the received signal as the signaling instants defined in the transmitted signal, said process characterized in that it includes the following steps:

(a) measuring the variation δX_{-1} of one of the characteristic parameters X of the received signal at an instant $t_{act}-\tau$, where t_{act} is the signaling instant defined by the receiver clock and τ is a small given time interval;

(b) measuring the variation δX_{+1} of parameter X on a second instant $t_{act}+\tau$;

(c) deriving from the measured values of variations δX_{-1} and δX_{+1}, a signal ϵ according to the following expression:

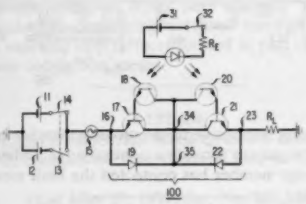
$$\epsilon = \overline{(\delta X_{-1})^2 - (\delta X_{-1})^2}; \text{ and}$$

(d) applying signal ϵ to the receiver clock to adjust the phase of the clock signals in a direction to reduce the value of the magnitude of ϵ.

4,137,428
OPTICALLY ACTUATED BIDIRECTIONAL SEMICONDUCTOR SWITCH

Joseph Federico, Berkeley Heights; Stephen Knight, Murray Hill, and Sigurd G. Waaben, Princeton, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 27, 1977, Ser. No. 845,930
Int. Cl.[2] H03K 17/78
U.S. Cl. 179—1 SW 14 Claims



1. Semiconductor apparatus which comprises:

(a) first and second photo-Darlington transistor devices connected series opposing between, respectively, first and second terminals;

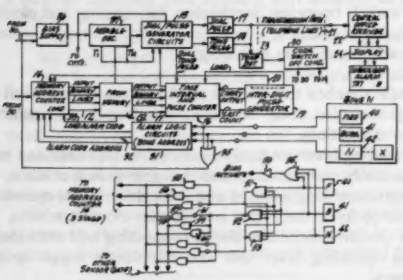
(b) a first unidirectional diode element connected across the first photo-Darlington device for conducting current between the first and second terminal in the opposite source of direction from that of the first photo-Darlington device;

(c) a second unidirectional element connected across the second photo-Darlington device for conducting current between the first and second terminals in the opposite sense of direction from that of the second photo-Darlington device.

4,137,429
DIGITAL DIALERS FOR USE IN THE SECURITY FIELD

Roy Stockdale, Huntington, N.Y., assignor to Napco Security Systems, Inc., Copiague, N.Y.

Filed Jun. 29, 1977, Ser. No. 810,930
Int. Cl.[2] H04M 11/04
U.S. Cl. 179—5 R 10 Claims



1. A telephone dialer apparatus of the type adapted to access a telephone line to transmit a dialing code via said line indicative of the location of a remote central station and to supply said station upon accessing of the same with a subscriber code address manifesting the location and condition of an alarm emanating from a monitored zone under surveillance, said zone including a plurality of alarm detectors, each capable of responding to a different alarm situation, comprising:

(a) a programmable accessible memory having a plurality of storage locations, with a first group of said locations storing a code indicative of the location of said remote central station, a second group of storage locations having stored therein a code indicative of the subscriber address code associated with said monitored zone, and a third group of storage locations having stored therein a plurality of codes, each indicative of a particular alarm condition present at said monitored zone, according to said detectors,

(b) first means coupled to said memory to cause said memory to first provide an output a first code associated with said first group of locations manifesting the location of said remote central station and means responsive to said code to provide a dialing format to said telephone line for accessing said central station,

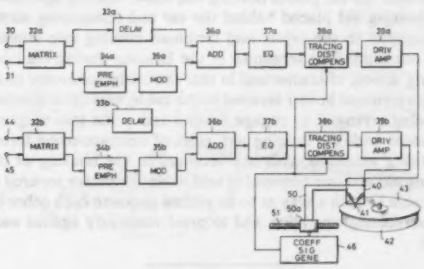
(c) logic means coupled to said memory and responsive to said first code being provided to cause said memory to provide a second code associated with said second group of locations for transmission to said remote station of a signal indicative of the address of said monitored zone, and

(d) means coupled to said memory and responsive to the transmission of said address signal to cause said memory to provide a third code associated with said third locations for transmission to said remote station an alarm signal indicative of the particular type of alarm situation emanating from said monitored location.

4,137,430
SYSTEM FOR RECORDING A SIGNAL WITH TRACING AND TRACKING DISTORTION COMPENSATION ON A RECORD DISC

Teruo Muraoka, Sagamihara, and Kohji Seki, Ichikawa, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jun. 22, 1976, Ser. No. 698,734
Claims priority, application Japan, Jun. 24, 1975, 50-76935
Int. Cl.[2] G11B 3/00
U.S. Cl. 179—100.4 C 6 Claims



1. A record disc recording system comprising:

means for supplying an input signal f(t) to said system for causing said system to record on a record disc;

cutter means having a cutting angle θ for recording by cutting on a record disc;

tracing and tracking distortion compensation means for producing an output signal $Tp^{-1}\{f(t)\}$ as expressed by the equation:

$$T_p^{-1}\{f(t)\} = f(t) - \frac{r\cos\theta}{2V^2}\{\dot{f}(t)\}^2\left[1 + \frac{\sin\theta \cdot \dot{f}(t)}{V} - \frac{r\cos\theta \cdot \ddot{f}(t)}{V^2}\right],$$

where

r is the radius of the tip of a stylus used for reproducing the signal recorded on the disc;

V is the linear velocity of the reproducing stylus relative to the sound groove of the record disc;

f(t) equals $d\{f(t)\}/dt$; and f(t) equals $d\{f(t)\}/dt$;

said tracing and tracking distortion compensation means having a coefficient weighting adder means for weighting a plurality of signals by a plurality of predetermined coefficients and adding the weighted quantities; and

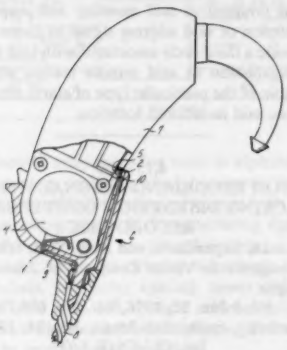
means responsive to the signal $Tp^{-1}\{f(t)\}$ for driving said cutter means in order to record a signal on the record disc.

4,137,431

CABLE CONNECTOR FOR HEARING AIDS

Hugo B. Pallesen, Bremerholm 26, DK-1069, Copenhagen, Denmark

Filed Nov. 17, 1977, Ser. No. 852,375
Claims priority, application Denmark, Nov. 19, 1976, 5211/76
Int. Cl.[2] H04R *25/00*
U.S. Cl. 179—107 H **6 Claims**



1. Cable connector for the connection of an electrical cable 8 to a near the ear places hearing aid, f.inst. hearing spectacles or a hearing aid placed behind the ear and comprising terminals secured to the cable, said terminals coming into contact with corresponding terminals in the housing during the connecting action, characterized in that the cable connector comprises a terminal holder secured to the cable, said cable connector being arranged to engage around and come into snap engagement with the hearing aid, pairs of corresponding terminals being mounted with one terminal in the housing of the hearing aid and one terminal in said cable connector secured to said cable in such a way as to be placed opposite each other by the connecting operation and to press resiliently against each other.

4,137,432

LIMIT SWITCH ASSEMBLY FOR MANUFACTURING MACHINE

Lawrence J. Kamm, 1515 Chatsworth Blvd., San Diego, Calif. 92107

Division of Ser. No. 468,760, May 10, 1974, Pat. No. 3,998,316.
This application Dec. 20, 1976, Ser. No. 752,107
Int. Cl.[2] H01H *3/16*
U.S. Cl. 200—47 **9 Claims**

1. A linear motion device for imparting controlled linear reciprocal motion to an element, comprising, in combination:

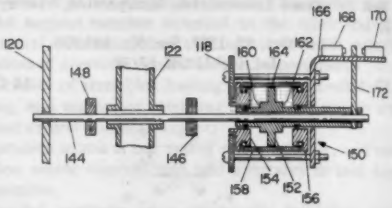
a stationary structure including a spar member, a shaft member and means for supporting the spar member and shaft member in spaced, parallel relationship,

a moving member including means for securing thereto the element to be moved,

the moving member further including bearing means for attaching the moving member to the spar member and shaft member for sliding reciprocal movement along a defined path parallel to the spar member and shaft member,

controllable drive means secured to the stationary structure which, when energized, drives the moving member along the defined path,

limit means supported by the stationary structure at a predetermined position along the defined path, and



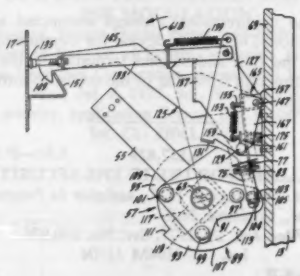
control means responsive to the moving member contacting the limit means to provide a control signal indicating that the moving member has contacted the limit means.

4,137,433

BOLTED PRESSURE SWITCH WITH SIDE OPERATOR MECHANISM AND DOOR ASSEMBLY INTERLOCK

James A. Erickson, and John W. Erickson, both of Crystal Lake, Ill., assignors to Boltswitch, Inc., Crystal Lake, Ill.

Filed Jun. 10, 1977, Ser. No. 805,597
Int. Cl.[2] H01H *9/20, 3/00*
U.S. Cl. 200—50 A **8 Claims**



1. A switch operating mechanism for opening and closing the movable contacts of a load break bolted pressure contact switch, said mechanism including:

a main shaft,

a handle attached to said main shaft for rotating said shaft in opposite directions, between switch-open and switch-closed positions,

an operating lever rotatably mounted on said shaft and mechanically connected to said movable switch contacts,

an overcenter toggle spring means for driving said operating lever to its contact-open and contact-closed positions,

a lost motion connection means connecting said main shaft, said operating lever and said overcenter toggle spring means,

said lost motion connection generally arranged so that initial rotation of the main shaft compresses the overcenter toggle spring means and moves it towards its center toggle position and specifically arranged so that during movement from said switch-closed position to said switch-open position, said operating lever is rotated before said spring means reaches its center toggle position, while during movement from said switch-open position to said switch-closed position, the spring means is moved past its center toggle position before said operating lever is rotated,

said overcenter toggle spring means connected to the lost motion connection means by a pin located in an elongated slot, the elongated slot having a detent projection dividing

the slot into two portions, the detent retaining the pin in one portion of the slot until overridden to allow the pin to move to the other portion of the slot, the overriding occurring as the toggle spring reaches its fully compressed condition.

2. The switch operating mechanism of claim 1 in which the switch operating mechanism is located in a housing having an access door and includes interlock means for the housing access door having means to latch the access door closed when the switch contacts are in their closed position and additional means to prevent the movement of the switch contacts to their closed position when the access door is open,

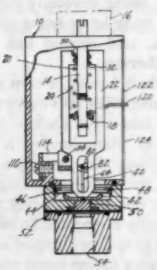
the interlock means being actuated through engagement with cam and stop surfaces formed as part of the best lost motion connection means.

4,137,434

FLUID PRESSURE RESPONSIVE DEVICE

Allen V. C. Davis, 5600 Alta Canyada Rd., La Canada, Calif. 91011

Filed May 27, 1977, Ser. No. 801,336
Int. Cl.² H01C *35/34*
U.S. Cl. 200—83 P **6 Claims**



1. In a pressure responsive device having a snap action disc spring which is actuated in response to fluid pressure, said actuation moving a movable element of an electrical switch, the improvement comprising:

a housing having an opening to which fluid under pressure may be applied, said disc spring being within said dressing;

a member covering said opening and adapted to prevent fluid from entering said housing,

said member being coupled to said disc spring, said member being exposed to and being movable by fluid pressure to cause said disc spring to undergo snap action for operating said movable element,

a helical spring in said housing;

means selectively positioning one end of said helical spring relative to the other end thereof so as to selectively place said helical spring in tension or in compression,

and means coupling said one end of said helical spring to said disc spring, with the helical spring being in tension at fluid pressures above a predetermined pressure and in compression at fluid pressures below said predetermined pressure.

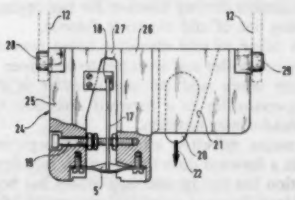
4,137,435

LOAD LIMITER

Georges Redon, Orleans, France, assignor to Societe Anonyme dite: Alsthom-Unelec, Paris, France

Filed Feb. 15, 1978, Ser. No. 877,853
Claims priority, application France, Feb. 24, 1977, 77 05428
Int. Cl.² H01H *3/02*
U.S. Cl. 200—85 R **8 Claims**

1. A load limiter for lifting apparatus for providing an electrical signal representative of a limiting load, the load limiter comprising a load-sensitive element and a hitching point disposed side by side between support points such that the application of a load to the hitching point tends to bend the load limiter beam-like between its support points, the load sensitive element being constituted by two blocks connected together by a resilient common portion which forms a pivot between the blocks, said blocks delimiting an empty space between facing surfaces, which empty space has an open end that tends



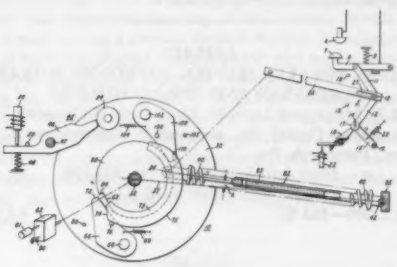
to be widened when the load limiter bends beam-like under load, said open end being bridged by a twisted resilient strip that tends to un-twist when tension is applied between its ends and having an actuator responsive to said untwisting under load to actuate an electrical switch thereby providing said electrical signal.

4,137,436

MEANS FOR MANUALLY SLOW-CLOSING A CIRCUIT BREAKER THAT HAS A SPRING-ACTUATED OPERATING DEVICE

Philip Barkan, Media, and Robert S. Barton, Bryn Mawr, both of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Jul. 21, 1976, Ser. No. 707,167
Int. Cl.² H01H *3/00*
U.S. Cl. 200—153 SC **22 Claims**



1. In a stored-energy operating device for closing a circuit breaker,

(a) a spring,

(b) a rotatable spring-controller mounted for rotation between first and second angularly-spaced dead-center positions with respect to said spring,

(c) means for transmitting charging forces to said spring in response to rotation of said spring-controller in a forward direction toward said first dead-center position,

(d) said spring acting to discharge and thereby further to rotate said spring-controller in a forward direction when said spring-controller has been rotated in a forward direction past said first dead-center position,

(e) releasable stop means coacting with said spring-controller for blocking said further forward rotation of said spring-controller when said spring-controller reaches an overcenter position slightly past said first dead-center position, said stop means being releasable to permit said spring to rapidly discharge and continue forward rotation of said spring-controller from said overcenter position into said second dead-center position,

(f) means for closing said circuit breaker in response to

forward rotation of said spring-controller into said second dead-center position,

(g) means for forwardly rotating said spring-controller from said second to said first dead-center position, thereby charging said spring, comprising:

(g1) cooperating pawl and abutment elements

(g2) a rotatable driving member for said spring-controller carrying one of said elements thereon,

(g3) the other of said elements being mounted on said spring-controller and arranged to be driven by said one element when said driving member is driving said spring-controller in a forward direction toward said first dead-center position,

(h) cam means effective after said spring-controller has passed in a forward direction through said first dead-center position but before said stop means has become effective to block forward rotational movement of said spring-controller for uncoupling said pawl and abutment elements so that said driving member is not imparting driving force to said spring-controller when said stop is blocking said spring-controller,

(i) an auxiliary element of the same type as said other element mounted on said spring-controller in a position angularly spaced from the location of said other element,

(j) said auxiliary element being engageable with said one element when said driving member is manually rotated in a forward direction through predetermined travel past the normal terminal position of said driving member at the end of a charging operation, additional manual rotation of said driving member in a forward direction while said one element and said auxiliary element are engaged acting to rotate said spring-controller into said second dead-center position, thereby to produce a manually-powered circuit-breaker closing operation, and

(k) means for effectively disabling said spring while said spring-controller is being manually rotated through said circuit-breaker closing operation.

4,137,437

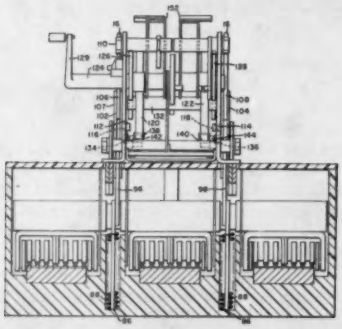
CIRCUIT BREAKER HAVING IMPROVED MOVABLE CROSSBAR AND SPRING HOLDER

Alfred E. Maier, and Louis N. Ricci, both of Chippewa Township, Beaver County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 3, 1977, Ser. No. 803,196

Int. Cl.[2] H01H *1/28, 3/42*

U.S. Cl. 200—153 SC **6 Claims**



1. A circuit breaker comprising:

stationary contact means,

a plurality of movable contacts operable between open and closed positions with respect to said stationary contact means;

a plurality of contact springs each engaging one of said movable contacts for increasing the engagement pressure between said stationary contact means and said movable contacts when said movable contacts are in the closed position;

a contact carrier engaging said movable contacts for holding said movable contacts such that said movable contacts move together between said open and closed positions;

a molded plastic holder secured to said contact carrier and having a first plurality of openings therein for holding said contact springs and a second plurality of openings therein of a size different from said first plurality of openings and capable of holding therein contact springs of a size different from the size of the contact springs disposed within said first plurality of openings, said holder having an aperture therethrough;

a cross arm disposed within said holder aperture and extending outwardly therefrom, said holder, said contact carrier, and said movable contacts moving upon movement of said cross arm; and

means engaging said cross arm for effecting movement of said cross arm to move said movable contact between said open and closed positions comprising:

toggle means engaging said cross arm for moving said movable contacts between said open and closed positions, said toggle means comprising first and second links and a toggle latch lever, said first link engaging said cross arm, said second link being pivotally connected to said first link, said toggle latch lever being pivotally connected to said second link, said second link having a drive pin fixedly secured thereto;

a rotatable drive shaft having a cam secured thereto, said cam being rotatable with said drive shaft;

means for rotating said drive shaft;

a rotatable follower plate having a cam roller secured thereto, said follower plate having a drive pawl pivotally secured thereto, said cam roller engaging said cam, said drive pawl being disposed adjacent said drive pin;

spring means pivotally connected to said follower plate and capable of being in spring charged and spring discharged positions, said spring means being charged by the rotation of said cam causing said cam roller engaged therewith to move outwardly causing rotation of said follower plate causing charging of said spring means, the changing of position of said spring means from charged to discharged causing rotation of said follower plate such that said drive pawl is capable of engaging said drive pin to move said toggle means into a toggle position, the movement of said toggle means into toggle position causing movement of said cross arm which moves said movable contacts into closed position;

releasable toggle latch means for holding said toggle means in toggle position; and,

releasable drive latch means for holding said follower plate in the spring charged position.

4,137,438

LEVER SWITCH

Hidetoshi Sato, and Masao Ohkita, both of Furukawa, Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Dec. 12, 1977, Ser. No. 859,686

Claims priority, application Japan, Dec. 13, 1976, 51-166893[U]

Int. Cl.[2] H01H *3/00, 15/18, 1/36*

U.S. Cl. 200—153 H **1 Claim**

1. A lever switch comprising:

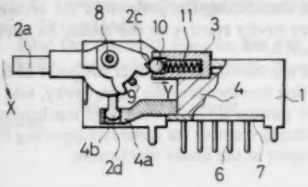
(a) a frame having oppositely facing positioning tongues formed in a rear portion thereof;

(b) a slider within said frame, said slider having a driving part;

(c) a click container within said frame, said container having a click member therein;

(d) a driving lever pivotally secured to said frame, said lever having a driving projection adapted for engagement with said driving part of said slider and a cam portion adapted for engagement with said click member;

(e) said click container having grooves formed therein, said grooves corresponding to said tongues whereby said click



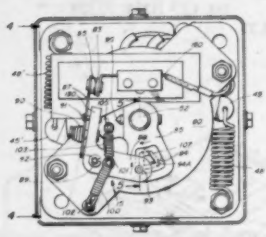
container may be attached to said frame by inserting said tongues into said grooves.

4,137,439

SELECTOR SWITCH RELAY

Alexander MacLean, Hingham, Mass., assignor to Electro Switch Corp., Weymouth, Mass.

Filed Jun. 24, 1977, Ser. No. 809,900
Int. Cl.[2] H01H *3/00, 21/04*
U.S. Cl. 200—153 L **17 Claims**



1. A rotary selector switch relay device capable of remote operation at high switching speed, having high torque but using a minimum sized rotary solenoid, said selector switch relay comprising,

an axially extending switch shaft carrying a plurality of substantially radially extending contacts, with said shaft being mounted for rotation about its axis,

a detent wheel coaxial with said switch shaft and fixed thereto,

spring means acting to maintain said detent wheel and shaft in a first position,

a spring loaded drive bar mounted substantially perpendicular to a central axis of said shaft and resiliently biased in one direction along said axis and reciprocally movable along said axis,

said drive bar being mounted in a slot whereby radial rotation of said bar about said shaft axis causes corresponding simultaneous rotation of said shaft and detent wheel,

a drive ratchet coaxially mounted with respect to said shaft engaging said drive bar and carrying a plurality of angularly arranged inclined surfaces whereby reciprocal arcuate movement of said ratchet causes arcuate movement of said shaft and detent wheel in a single direction at predetermined arcuate increments,

a rotary solenoid for driving said ratchet wheel,

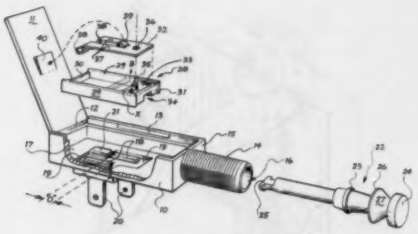
said spring means acting to multiply arcuate movement in said shaft over corresponding arcuate movement of said ratchet means whereby a solenoid with a small degree of arcuate movement and high power can be used to cause a high degree of arcuate movement in said switch shaft.

4,137,440

ELECTRICAL SWITCH

Stanley Bryant, Taree, Australia, assignor to Bryant Manufacturing Pty. Limited, Taree, Australia

Filed Jun. 28, 1977, Ser. No. 810,865
Claims priority, application Australia, Jul. 7, 1976, PC6558
Int. Cl.[2] H01H *3/12;*
U.S. Cl. 200—159 R **11 Claims**



1. A switch comprising: an open-topped housing including a base; a lid adapted to close the housing top; tubular mounting means for the housing formed on and projecting from one end of the housing; a plurality of contact pieces mounted in the housing base, said contact pieces including contact blocks projecting into the housing in tranversely spaced, parallel relationship and integral terminals projecting out of the housing base; a plunger mounted for longitudinal sliding movement in the mounting means, said plunger having one of its ends projecting from the mounting means for application of a moving force and having its other end located within the housing; a contact connector assembly releasably mounted upon the other end of the plunger, said connector assembly including at least one metal contact plate which has a plurality of contact fingers extending therefrom corresponding in number to the number and transverse spacing of the contact blocks, said fingers each having a contact formed thereon for engagement with at least one aligned contact block; and means integrally formed on the contact plate and extending upwardly for engaging the lid when the lid is closed to resiliently bias the fingers towards the housing base; the length of said fingers and of said contact blocks being arranged so as to connect the contacts with and disconnect them from predetermined ones of said contact blocks in a scrubbing movement under the action of said bias in response to longitudinal movement of the plunger.

4,137,441

MICROWAVE OVEN DOOR SEAL SYSTEM

Arnold M. Bucksbaum, Cedar Rapids, Iowa, assignor to Amana Refrigeration, Inc., Amana, Iowa

Continuation of Ser. No. 563,935, Mar. 31, 1975, abandoned.
This application May 10, 1977, Ser. No. 795,580
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 D **13 Claims**

1. In a microwave oven excited with microwave energy of a predetermined frequency having an oven wall region providing an access aperture closed by a door and having a microwave energy seal for preventing leakage of microwave energy through the space between peripheral regions of said aperture and peripheral regions of said door;

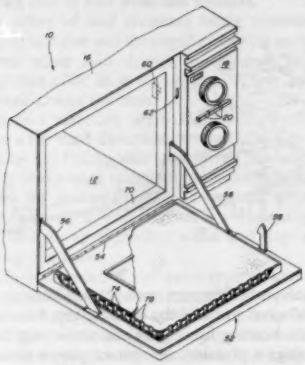
said seal having an input transmission line section and a choke section coupled to said input section, said input section comprising conductive portions of said wall oven spaced from conductive portions of said door by a dielectric medium comprising a solid dielectric having a dielectric constant substantially greater than unity and with said choke section comprising conductive portions of said door substantially enclosing a dielectric medium comprising a solid whose dielectric constant is substantially greater than unity;

the improvement comprising:

said choke section being formed with dimensions which would resonate at a frequency below said predetermined frequency of said oven if said choke were filled with said solid dielectric;

a portion of said solid dielectric being omitted in a tuning region adjacent said coupling region to provide an average dielectric constant in said tuning region which is lower than the dielectric constant of the major portions of said choke section dielectric medium; and

the size of said omitted dielectric portion being selected to resonate said choke section substantially at said predetermined microwave oven excitation frequency.



4,137,442

HIGH-FREQUENCY OVEN HAVING A BROWNING UNIT

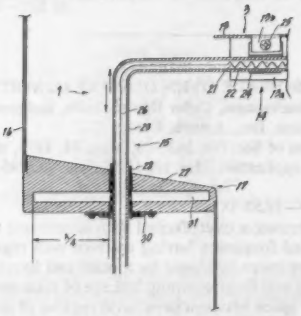
Koichi Tateda, Yao, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 579,917, May 22, 1975, abandoned. This application Sep. 15, 1977, Ser. No. 833,652

Claims priority, application Japan, May 24, 1974, 49-59028

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 B **4 Claims**



1. A microwave cooking apparatus comprising:

a. an oven cavity containing a means for supporting foodstuff,

b. a magnetron operatively associated with said oven cavity for generating and introducing microwave energy into said oven cavity,

c. a browning unit for browning foodstuffs contained in the oven cavity,

d. a supporting member extending from the outside into the inside of said oven cavity for supporting the browning unit in said oven cavity,

e. a shifting means operatively connected to said supporting member for shifting the position of the browning unit in the oven cavity relative to the means for supporting the foodstuff,

f. a choke mechanism provided at the point of entry of said supporting member into the oven cavity, said supporting member passing through the choke mechanism, and

g. an insulating member for slidably supporting the supporting member in the choke mechanism.

4,137,443

WELDING APPARATUS FOR DENTAL PURPOSES

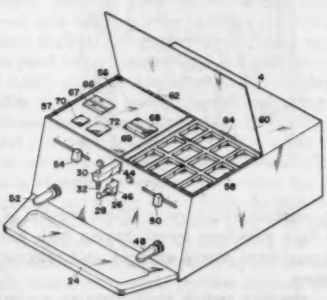
Fumio Yogosawa, Tokyo, Japan, assignor to Sankin Kogyo, Ltd., Osaka, Japan

Filed Apr. 20, 1977, Ser. No. 789,092

Claims priority, application Japan, Nov. 11, 1976, 51-151415

Int. Cl.[2] B23K 11/28

U.S. Cl. 219—86.21 **6 Claims**



1. A welding apparatus for dental purposes comprising:

a pair of supporting members vertically disposed on a base plate,

a bar fixed at its both ends to the upper portion of said supporting members,

a plate means which has a vertical extension and is pivotally connected with said bar so that it is pivotable relative to said base plate,

an upper arm which has an upper electrode at one end thereof and is connected at the other end to the vertical extension of said plate means,

a lower arm which has a lower electrode at one end thereof and is swingably supported by said bar at the substantially middle portion of said bar so that it is pivotable relative to said base plate,

a switch means having a microswitch which is switched upon contact by said lower arm, and

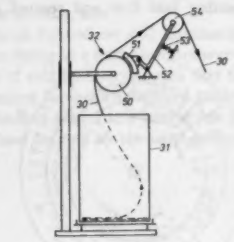
an electrical circuit device which has charging and discharging transformers,

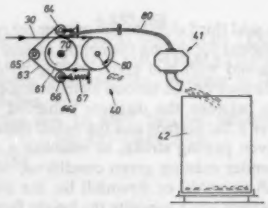
wherein when said plate means is pushed downward and pivoted relative to said base plate, said upper electrode pushes said lower electrode to thereby pivot said lower arm and actuate said switch means, thereby feeding an electric current to said upper and lower electrodes.

4,137,444
WIRE RESISTANCE-ROLL WELDER WITH BRAKE AND TENSION DEVICES

Fred Schalch, Le Landeron, Switzerland, assignor to Fael S.A., Saint-Blaise, Switzerland

Filed Oct. 31, 1977, Ser. No. 846,633
Claims priority, application Switzerland, Nov. 10, 1976, 14144/76
Int. Cl.[2] B23K *11/06*
U.S. Cl. 219—81 4 Claims





1. An electrical resistance-roll seam welding machine for welding a workpiece, comprising:

a pair of welding rolls;

supply means defining a supply station for fresh welding wire for infeeding at least one electrode wire;

means providing a collecting station for consumed welding wire;

said supply means delivering the electrode wire by means of at least one of the welding rolls to said collecting station;

said welding rolls forming means for placing the welding wire into contact with a workpiece to be welded;

a brake device for the electrode wire arranged between the supply station and the welding rolls;

a tension device for the electrode wire arranged between the welding rolls and the collecting station;

the sum of the tension force exerted by the tension device upon the wire and the brake force exerted by the brake device upon the wire being large enough to continuously tension the electrode wire as it moves along its path of travel between the brake device and the tension device;

drive means operatively coupled with at least said one welding roll over which there is guided the electrode wire;

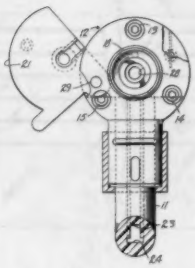
said drive means imparting by means of said one welding roll over which the electrode wire is guided a speed of travel to said electrode wire which corresponds to the desired feed speed of the workpieces during formation of the welding seam; and

the difference between the tension force exerted by the tension device upon the electrode wire and the brake force exerted by the brake device upon the electrode wire being smaller than the environment force exerted upon the electrode wire by the periphery of said one welding roll.

4,137,445
STUD RECEIVER

Donald H. Ettinger, Royal Oak, Mich., assignor to USM Corporation, Farmington, Conn.

Filed Oct. 4, 1977, Ser. No. 839,396
Int. Cl.[2] B23K *9/20*
U.S. Cl. 219—98 8 Claims



1. In a device for arc welding headed studs to a work surface wherein the studs are fed seriatim to a stud retaining collet, the combination of a two part receiver block having a cylindrical bore formed therein through which a stud is fed axially to said collet,

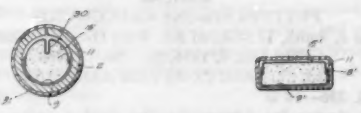
a second bore formed in said block and intersecting said cylindrical bore, said second bore being formed with an internal cross section substantially T-shaped to receive a stud fed therethrough in a direction normal to the stud axis,

said receiver block comprising a fixed part which maintains said cylindrical bore in alignment with said collet and a second part movable relative to said first part, said second part of said receiver block comprising that portion of cylindrical bore which intersects with T-shaped bore whereby headed studs which become jammed during operation at the bore intersections are readily removed from the device.

4,137,446
WELDING WIRE CONSTITUTED BY A CORE OF WELDING POWDER ENCLOSED BY A MANTLE OF METAL AND A METHOD OF PRODUCING THE WELDING WIRE

Jacques Blanpain, Gentbrugge, and Leon Delehouzee, Wondelgem, both of Belgium, assignors to Acieries Reunies de Burbach-eich-Dudelange S.S.Arbed, Luxembourg

Continuation-in-part of Ser. No. 572,636, Apr. 29, 1975, Pat. No. 4,048,705. This application Aug. 10, 1977, Ser. No. 823,460
Claims priority, application France, May 22, 1974, 74 17830
Int. Cl.[2] B23K *35/02, 35/10*
U.S. Cl. 219—145.22 8 Claims

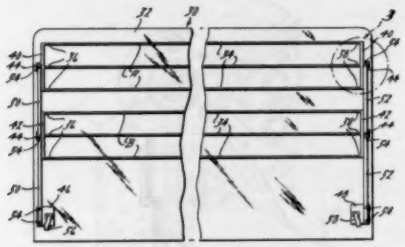


1. A welding wire constituted by a core of welding powder enclosed by a mantle of metal, said mantle of metal being formed by an inner metallic sheath and an outer metallic sheath surrounding said inner sheath and having longitudinal edge portions closely adjacent each other, said inner sheath being constituted by two separate bands each lining about half of the inner surface of the outer sheath and each having longitudinal edge portions displaced circumferentially about 90° from the edge portions of the outer sheath.

4,137,447
ELECTRIC HEATER PLATE

Premaksran T. Boaz, Southgate, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 28, 1978, Ser. No. 900,947
Int. Cl.[2] H05B 3/06
U.S. Cl. 219—522 2 Claims



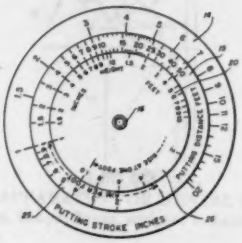
1. An electric heater plate comprising:
a sheet of tempered glass,
a plurality of thin lines of a silver ceramic material bonded to one surface of said sheet of tempered glass and extending in a generally parallel but spaced apart relationship across a dimension of said sheet of tempered glass, each of said plurality of thin lines having left hand and right hand end portions defined at opposite ends thereof, a number of said plurality of thin lines forming a group of thin lines,
a pair of relatively thin interconnection strips of a silver ceramic material bonded to said one surface of said sheet of tempered glass, individual ones of said pair of interconnection strips interconnecting said left hand and right hand end portions of a group of said thin lines,
a small terminal area of a silver ceramic material associated with each of said interconnection strips, each of said terminal areas being bonded to said one surface of said sheet of tempered glass, said terminal area being interconnected with its associated left hand or right hand interconnection strip,
a pair of termination areas of silver ceramic material, one of said pair of termination areas being bonded to said one surface of said sheet of tempered glass at a position spaced from and out of contract with said thin lines said left hand and right hand interconnection strips and said small terminal areas,
a pair of thin copper strips, one of said copper strips being bonded to each of said terminal areas and said termination area associated with said left hand or said right hand interconnection strip to electrically interconnect the same, and
a pair of electrical leads, one connected to each of said pair of termination areas.

4,137,448
PUTTING STROKE CALCULATOR

William J. Smith, 17 Mildred Rd., West Hartford, Conn. 06107

Filed Oct. 4, 1976, Ser. No. 729,400
Int. Cl.[2] G06C 27/00, 3/00; A63B 55/00
U.S. Cl. 235—78 G 3 Claims

1. A device for determining the putting stroke required under existing green conditions to drive a golf ball through distances between the ball and a hole, said distances being proportional to the square of said putting stroke, comprising,
a first element having a logarithmic putting stroke scale with scale divisions bearing number indicia representing putting strokes,
a second element having a logarithmic putting distance scale with scale divisions bearing number indicia representing the squares of putting strokes,
a third element having a logarithmic scale with scale divisions bearing number indicia representing heights between ball and hole on uphill or downhill lies,
and means mounting said first and second elements for movement relative to one another for setting the putt distance on said second element scale opposite a given putt stroke on said first element scale which produced the putt distance to establish the proportionality between putting stroke and distance under existing green conditions, whereby thereafter the putting stroke necessary to drive a golf ball over any estimated distance between lie and hole may be read off the said first element scale opposite the estimated distance on said second element scale,
said means mounting said first and second elements also

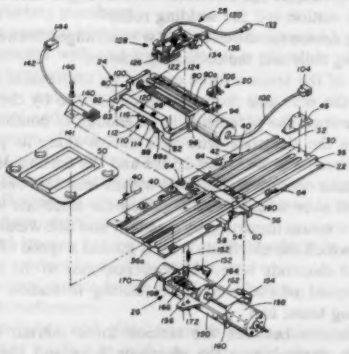


mounting said third element for movement relative to said second element for setting the height on said third element scale achieved with said given putting stroke opposite a putting distance on the second element scale, which is the difference between the distance achieved by the given stroke over a flat surface and the uphill distance achieved by the given putting stroke, to establish a compensating distance under existing green conditions, whereby when faced with an uphill or downhill lie, the distance on the second element scale opposite the height faced on the first element scale which must be added to or subtracted from the uphill or downhill distance between ball and hole can be determined and the putting stroke required for the resulting distance can be read off the first element scale.

4,137,449
TRACKING MOUNT ASSEMBLY

Robert H. Townsend, Richardson, and Barry C. Kockler, Lewisville, both of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 28, 1977, Ser. No. 763,485
Int. Cl.[2] G06K 13/06, 7/08
U.S. Cl. 235—485 4 Claims



1. In a card transport system, a card tracking assembly comprising:

a magnetic card support platform,

a top surface formed on said magnetic card support platform, and having a card guide surface thereon adjacent to said top surface,

a tracking mount frame,

a lead screw mounted for selective rotation in said tracking mount frame,

a guide shaft mounted in said tracking mount frame,

a plurality of alignment lugs extending from said tracking mount frame and engageable with the card guide surface for aligning the lead screw and guide shaft relative to the card guide surface, and

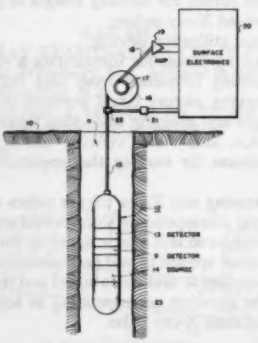
alignment faces formed on said alignment lugs, said alignment faces being in a first plane transverse to the longitudinal axis of said lead screw such that the engagement of said alignment faces with the card guide surface positions the longitudinal axis of said lead screw perpendicular to a second plane defined by the card guide surface.

4,137,450

DUAL DETECTOR PULSED NEUTRON LOGGING FOR PROVIDING INDICATION OF FORMATION POROSITY

Eric C. Hopkinson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 13, 1977, Ser. No. 806,050
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—264 **20 Claims**



1. A method for logging the formations surrounding an earth borehole, comprising:

pulsedly irradiating said formations with discrete bursts from a source of high energy neutrons;

detecting radiations emanating from said irradiated formations at first and second points spaced from said source of high energy neutrons;

generating electrical signals indicative of said detected radiations;

gating the said electrical signals indicative of the radiation detected at said first point for a first time interval following each of said bursts of high energy neutrons;

gating the said electrical signals indicative of the radiation detected at said second point for a second time interval following each of said bursts of high energy neutrons, said first time interval being of lesser duration than said second time interval; and

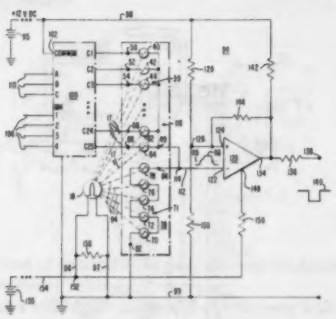
combining said gated first and second electrical signals to produce an indication of the porosity of said formations.

4,137,451

DETECTING CIRCUIT FOR A PHOTOCELL PATTERN SENSING ASSEMBLY

Charles W. Einolf, Jr., Murrysville Borough, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1977, Ser. No. 863,192
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 SE **11 Claims**



1. A photocell detecting circuit for sensing a coded pattern of light radiations produced by an optically coded pattern having opaque and transparent code segments which correspondingly transmit and block the light radiations at a plurality of sensing positions, said photocell detecting circuit comprising:

an array of encoding photocells having a separate one of said encoding photocells located at each of said sensing positions for response to the transmitted and blocked coded light radiations;

a reference photocell circuit including at least one reference photocell located for receiving light radiations independent of said coded light radiations;

means including a sequential sampling control circuit for combining lighted and unlighted output values of each encoding photocell with a lighted output value of said reference photocell circuit so as to produce a signal to be sensed having variable magnitudes responsive to the combined output values of separate ones of said encoding photocells and of said reference photocell circuit;

analog voltage comparator means having first and second inputs and an output, said first input receiving said signal to be sensed, said second input having a predetermined reference voltage connected thereto to establish a predetermined threshold value in said comparator means, and said output of said comparator means producing an output binary signal having first and second signal values responsive to the signal to be sensed increasing and decreasing above and below said threshold value; and

inhibiting circuit means connected to said comparator means so as to render the comparator output active and inactive in response to the presence or absence, respectively, of a predetermined malfunction condition in said photocell detecting circuit.

4,137,452

METHOD OF MEASURING HORIZONTAL FLUID FLOW IN CASED OFF SUBSURFACE FORMATIONS WITH MANGANESE COMPENSATION

Hans J. Paap; Dan M. Arnold, and Hubert D. Scott, all of Houston, Tex., assignors to Texaco, Inc., New York, N.Y.

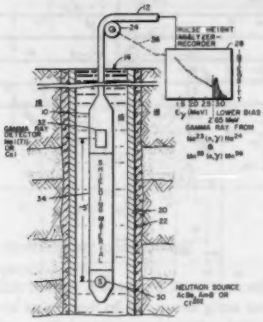
Filed Jun. 20, 1977, Ser. No. 808,422
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—270 **10 Claims**

1. A method for determining the location and flow rate of

earth formation fluids moving in a horizontal direction past a steel casing in a well borehole comprising the steps of:

(a) irradiating the earth formations in the vicinity of a well borehole with fast neutrons for a predetermined length of time to neutron activate elements in the casing and at least one selected tracer element in the earth formation fluid moving past the well borehole;

(b) detecting during at least three separate time intervals count rate signals representative of gamma radiation



caused by the radioactive decay of elements in the casing and the selected tracer element;

(c) measuring the at least three time intervals during which said step of detecting is being performed; and

(d) obtaining, from the at least three detected count rate signals and the at least three measured time intervals the flow speed of the fluid, a measure of the amount of gamma radiation attributable to elements in the casing and a measure of the amount of gamma radiation attributable to the tracer element in the fluid.

4,137,453

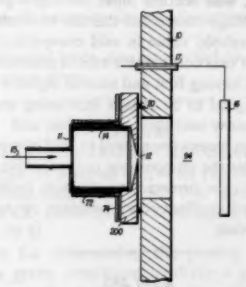
METHODS AND APPARATUS FOR IMPROVING ELECTRON CAPTURE DETECTORS BY COLLECTION OF IONS

Melvin W. Siegel, Pittsburgh, Pa., assignor to Extranuclear Laboratories, Inc., Pittsburgh, Pa.

Filed Aug. 31, 1976, Ser. No. 719,280

Int. Cl.² G01T *1/18*

U.S. Cl. 250—382 **43 Claims**



1. A method of measuring concentrations of sample molecules in a carrier gas which comprises the steps of forming a carrier gas-sample molecule mixture with a mixture of a concentration of free electrons and sample molecule ions, removing substantially all of said free electrons from said ions, and collecting and measuring said ions, said ion measurement being proportional to the sample molecule concentration in the carrier gas, said forming step occurring in a first region having an absolute pressure the range of 0.1 torr to 100 atmospheres and said collecting step occurring in a second region having a lower pressure than said first region.

4,137,454

RADIOGRAPHY

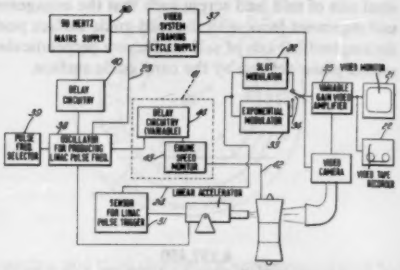
Robert J. Brandon, Jr., Toronto, Canada, assignor to Rolls-Royce (1971) Limited, London, England

Filed Mar. 2, 1977, Ser. No. 773,794

Claims priority, application United Kingdom, Mar. 9, 1976, 9264/76

Int. Cl.² G03B *41/16*

U.S. Cl. 250—402 **8 Claims**



1. A video viewing system used with a pulsed X-ray fluoroscopy system comprising:

means for supplying X-ray trigger pulses;

means responsive to said X-ray trigger pulses for generating pulses of X-rays;

a fluorescent screen for forming images in correspondence with received X-ray pulses;

a video signal utilization device;

a video viewing means for formulating a video signal at a given framing frequency from said fluorescent screen images having picture detail portions corresponding to said images and applying said video signal to said utilization device, said video viewing means including gain control means for varying the amplitude of said video signal;

means for sensing said X-ray trigger pulses and for producing a signal corresponding to each said trigger pulse; and

means responsive to said sensor signal for formulating a gain control signal applied to said gain control means to reduce the gain applied to said video signal and thus its amplitude for a time duration corresponding at least to the initial portion of each X-ray pulse.

4,137,455

MEDICAL RADIOGRAPHIC APPARATUS WITH MEANS FOR NOTATING DETECTOR RING

Richard W. Fetter, Warrenville, Ill., assignor to EMI Limited, Middlesex, United Kingdom

Filed Jun. 29, 1977, Ser. No. 811,279

Int. Cl.² A61B *6/02*

U.S. Cl. 250—445 T **11 Claims**

1. Medical radiographic apparatus, for investigating a cross-sectional slice of a patient's body, including a source of a fan-shaped distribution of penetrating radiation, such as X-radiation, locating means for locating the source, in relation to the patient's body, so that said radiation is directed towards said slice, scanning means for rotating said source around the patient's body to direct radiation towards said slice from a plurality of different directions, detector means comprising a plurality of detector devices, sensitive to said radiation, disposed along an arcuate path surrounding, or partly surrounding, the patient's body, the detector devices being substantially immobile in the direction of rotation of said source, means

locating said detector devices such that said arcuate path is closer to the patient's body than the source of radiation throughout the rotational movement of said source, and means for moving detector devices for the time being disposed at the

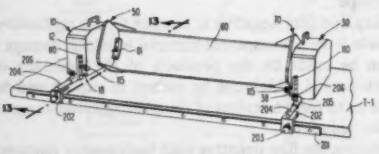
same side of the patient's body as the source so that they do not interrupt the detection of said radiation by detector devices for the time being disposed at the opposite side of the patient's body to said source.

4,137,456

INFANT X-RAY EXAMINATION CRADLE SYSTEM

William F. Hogan, Woodbury, N.J., assignor to Spectrum X-Ray Corporation, Westville, N.J.

Filed Nov. 1, 1976, Ser. No. 737,486
Int. Cl.² G01N *21/00, 23/00*
U.S. Cl. 250—456 **7 Claims**



1. An infant basket assembly for X-ray examination, said assembly comprising:

a. an infant basket having:

a-1 head and foot upright end sections;

a-2 an infant-supporting center panel spanning between said end sections;

a-3 clamp means at each end section for detachably securing said end sections to opposite ends of said center panel, said clamp means including manually operable lever cam means for moving said clamp into and out of clamping position;

a-4 a pivot shaft extending axially outwardly from each end section;

a-5 support means for each pivot shaft;

a-6 drive means connected to one of said pivot shafts for driving said one pivot shaft rotationally;

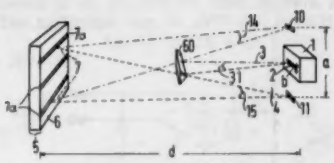
b. attachment means for attaching said support means to table-top X-ray examination means.

4,137,457

METHOD OF PRODUCING IMPLANTED AREAS IN A SUBSTRATE

Eberhard Krimmel, Pullach, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 17, 1977, Ser. No. 825,248
Claims priority, application Fed. Rep. of Germany, Sep. 22, 1976, 2642599
Int. Cl.² A61K *27/02*
U.S. Cl. 250—492 A **1 Claim**



1. A method of producing dopant material implanted areas in a semiconductor substrate, comprising:

generating a main beam composed of relatively high kinetic energy dopant material ions;

dividing said main beam into at least two coherent dopant material ion sub-beams which are superposed in relation to one another; and

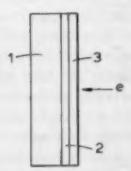
positioning said semiconductor substrate relative to said sub-beams so that said substrate is irradiated by said sub-beams and so that the maxima and/or minima of an interference pattern formed by said dopant ion sub-beams is located on a surface of said substrate.

4,137,458

ELECTRON IMAGE PROJECTION MASKS

Hewson N. G. King, Redhill, and Julian P. Scott, Brighton, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,180
Claims priority, application United Kingdom, Sep. 9, 1976, 37390/76
Int. Cl.² A61K *27/02*
U.S. Cl. 250—492 A **4 Claims**

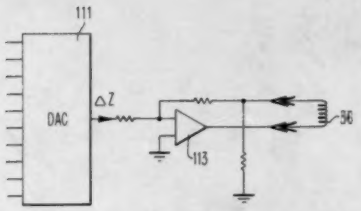


1. An electron image projection mask consisting of an optical mask comprising a transparent substrate, an opaque mask pattern disposed on said substrate, a transparent coating extending over said mask pattern and the areas of said substrate exposed through the apertures in said opaque mask pattern, and a metal image extending over said transparent coating and having a pattern corresponding to the apertures in said opaque mask pattern, the optical density of said metal image being such as to reduce the average light transmission through the apertures in the mask to a value between 25 and 80% of the average light transmission of said apertures in the absence of said metal image.

4,137,459
METHOD AND APPARATUS FOR APPLYING FOCUS CORRECTION IN E-BEAM SYSTEM

Drew E. Albrecht, Flanders, N.J.; Samuel K. Doran, Putnam Valley, N.Y.; Michel S. Michail, Wappingers Falls, N.Y., and Hannon S. Yourke, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,198
Int. Cl.² A61K *27/02*
U.S. Cl. 250—492 A **3 Claims**

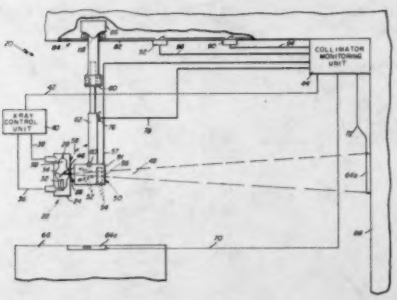


1. In an electron beam system which includes registration means that calculate the apparent magnification and rotation error of a given target chip, the improvement comprising means for utilizing the calculated magnification and rotation error information to calculate a height error factor and means to apply a compensating current proportional to said height error factor to a dynamic focusing coil of the system to move the effective beam focal plane of the system to a position which matches the target plane at each chip site.

4,137,460
RADIOGRAPHIC SYSTEM

Thomas W. Fitzsimmons, Bethel; Vincent Berluti, Jr., West Haven; Howard G. Wagner, Stamford, and Jonathan S. Shapiro, Greenwich, all of Conn., assignors to The Machlett Laboratories, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 587,447, Jun. 16, 1975, Pat. No. 4,018,716. This application Jun. 17, 1976, Ser. No. 696,977
Int. Cl.² G21F *5/04*; G21K *1/04*
U.S. Cl. 250—511 **10 Claims**

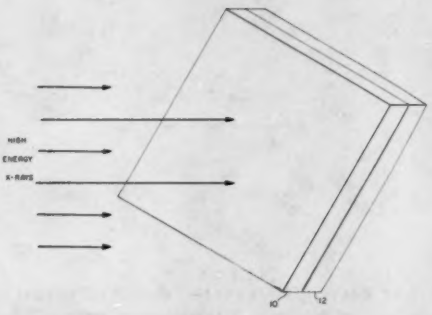


1. A radiographic system comprising
means for directing an X-ray beam from a source through an adjustable shutter aperture in an aligned collimator and onto an image receptor located at a preselected distance from the source; and
automatic means connected to the source, the collimator, and the image receptor for ensuring that the cross-sectional size of the X-ray beam conforms to the size of the image receptor at the selected distance from the source, the automatic means including;
a read-only memory module disposed to receive electrical signals indicative of operating parameters and programmed to produce a desired output signal upon receipt of a prescribed series of operating parameters, the module comprising an interchangeable semiconductor integrated circuit device;
receptor detector means disposed for engagement with the image receptor and electrically connected to the memory module for producing electrical signals indicative of the image receptor in position to receive the X-ray beam; and
orientation detector means connected to the collimator and electrically connected to the memory module for producing electrical signals indicative of the orientation of the shutter aperture with respect to the image receptor.

4,137,461
PHOTOGRAPHIC IMAGE ENHANCEMENT BY PHOTOFISSION

Kenneth M. Murray, Falls Church, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 16, 1977, Ser. No. 852,126
Int. Cl.² G03C *5/08, 5/46, 11/22*
U.S. Cl. 250—526 **6 Claims**



1. A method for producing a plate having a replica image of the photographic image on a developed film negative comprising the steps of:
toning said film negative with a "stable photofissionable isotope";
placing said film negative in contact with a replication plate made from a transparent material in which damage tracks can be made by the products of the fissioning of said isotope and which can be etched to expose said damage tracks to form a replica of the photographic image on said film negative;
irradiating the film negative with high-energy photons while it is in contact with said replication plate so as to cause said isotope to fission and produce damage tracks in said replication plate because of the fission products; and
removing the film negative from said replication plate.

4,137,462
PROBE FOR MEASURING STEAM QUALITY

John S. Wyler, Andover, Mass., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 31, 1977, Ser. No. 846,943
Int. Cl.² G01N *21/26*
U.S. Cl. 250—573 **8 Claims**

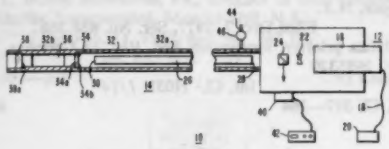
1. A steam quality measuring apparatus comprising:
a laser apparatus from which a primary light beam is emittable;
means for splitting the primary light beam into a plurality of secondary light beams, said primary light beam being receivable from said laser;
a bundle of optical fibers which transmit at least one of said

secondary light beams therethrough from a first end adjacent said splitting means to a second end;

a specimen steam channel for routing steam across the path of said secondary light beam;

a mirror disposed adjacent said specimen channel for reflecting light directed thereto through said specimen channel from said optical fibers;

a substantially transparent barrier for transmitting light emitted by said optical fiber bundle therethrough, said



mirror and specimen steam channel being isolated from the optical fiber bundle by said transparent barrier wherein said barrier has a first surface adjacent said specimen channel;

means for preventing moisture formation on said transparent barrier and mirror; and

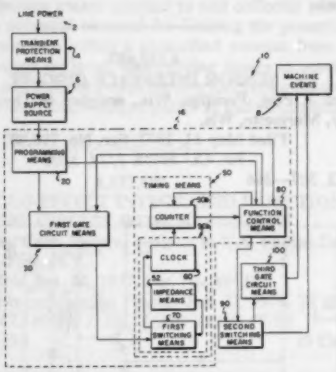
a photodetector which provides a signal indicative of the intensity of the reflected light directed thereto from said mirror, said reflected light's intensity being characteristic of the steam's quality.

4,137,463

CONTROL SYSTEM UTILIZING MOMENTARY SWITCHING DEVICES

Charles E. Scott, Noblesville, and James E. Small, Indianapolis, both of Ind., assignors to P.R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Jun. 16, 1977, Ser. No. 807,009
Int. Cl.[2] H03K *19/08*
U.S. Cl. 307—141 **41 Claims**



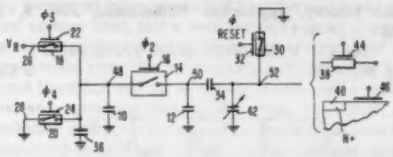
1. A control circuit for a machine and the like having at least one cycle made up of at least one event comprising: a plurality of momentarily operable programming means for actuating said cycle and for selectively programming a plurality of time periods of said event, first gate circuit means responsive to a momentary signal provided by said programming means for latching said control circuit in at least one mode of operation, timing mens responsive to said latching of said first gate circuit means for timing said event in accordance with a selectively programmed time period, said timing means including an oscillator circuit means for generating a series of electrical pulses having a frequency variable in accordance with said selectively programmed time periods and a counter for counting a fixed number of said electrical pulses generated by said oscillator circuit means, and function control means responsive to an electrical signal provided by said timing means when said fixed number of said electrical pulses have been counted for latching said control circuit in at least another mode of operation.

4,137,464

CHARGE-TRANSFER BINARY SEARCH GENERATING CIRCUIT

Lawrence G. Heller, Brewster, and Lewis M. Terman, South Salem, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 670,781, Mar. 26, 1976, abandoned.
This application Aug. 16, 1977, Ser. No. 825,016
Int. Cl.[2] H03K *4/02*
U.S. Cl. 307—227 **4 Claims**



1. A circuit for generating a binarily decreasing sequence of electrical signal levels comprising:

a first capacitive electrical signal storage means adapted to store up to a predetermined quantity of electrical signal E_R,

a second capacitive electrical signal storage means also adapted to store up to said predetermined quantity of electrical signal E_R,

an electrical signal transfer means including a first switching element providing an open state and a closed state and connected between said first and second capacitive electrical signal storage means for transferring a selected amount of electrical signal of said predetermined quantity of electrical signal E_R from one of said capacitive storage means to the other of said capacitive storage means when said switching element is closed during a given time period,

said first and second capacitive electrical storage means being connected in parallel when said switching element is closed to produce a parallel capacitance value,

an output terminal,

a third capacitive electrical signal storage means having a capacitance relatively smaller than the capacitance of said first and second capacitive electrical signal storage means and having one side thereof connected in series circuit with said second capacitive electrical signal storage means and the other side of said third capacitive electrical signal storage means being connected to said output terminal, said third capacitive electrical signal storage means being connected in series with the parallel combination of said first and second capacitive electrical signal storage means when said switching element is closed to produce a combined capacitance value with said first and second capacitive electrical signal storage means which is less than the said parallel capacitance value of said first and second capacitive electrical signal storage means,

a source of reference potential,

a second switching element connected between said source of reference potential and said first electrical capacitive signal storage means,

and means including first and second signal conductors for producing a plurality of sequential control signals including a first sequence of electrical pulses occurring at a selected time sequence on said first signal conductor connected to said first switching element of said electrical signal transfer means for placing said first switching element into said open and closed states and a second sequence of electrical pulses occurring at said selected time sequence on said second signal conductor connected to

said second switching element, said first and second sequence of signals and said associated first and second switching elements operating in combination for controlling the transfer of quantities of electrical signal between said first and second capacitive storage means for producing a binarily decreasing sequence of electrical signal quantities at said output terminal of the form $E=E_R/2$, $E_R/4$, $E_R/8$ up to $E_R/2^N$ where N is a positive integer.

4,137,465

MULTI-STAGE INTEGRATED INJECTION LOGIC CIRCUIT

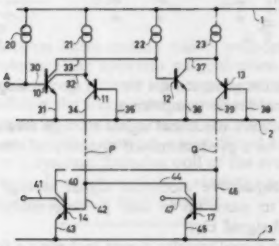
Cornelis M. Hart, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 2, 1977, Ser. No. 802,939

Claims priority, application Netherlands, Jun. 9, 1976, 7606193

Int. Cl.[2] H03K *17/04, 17/60, 3/286, 19/08*

U.S. Cl. 307—255 **3 Claims**



1. A circuit comprising

voltage supply terminals;

a plurality of circuit stages connected in series across said voltage supply terminals so as to include a first in the series connected closer to one supply terminal and defined as a higher stage and at least a second in the series connected further from said one terminal and defined as a lower stage, and current injector means in a plurality of said circuit stages for supplying current thereto;

said first stage including: a first switching transistor of the first conductivity type having emitter, base, and one or more collectors; a first auxiliary transistor of a second conductivity type having emitter, base, and collector; means connecting a collector of said first switching transistor to the emitter of said first auxiliary transistor, and the base of said first switching transistor to a current injector in said first stage;

said second stage including a second switching transistor of the first conductivity type having emitter, base, and one or more collectors;

means connecting the collector of said first auxiliary transistor to the base of said second switching transistor for supplying a signal thereto;

a third switching transistor of the first conductivity type having emitter, base, and one or more collectors; means connecting a collector of said third switching transistor to the base of said second switching transistor, and the base of said third switching transistor to a collector of said second switching transistor;

a second auxiliary transistor of the second conductivity type having emitter, base, and collector; means connecting the collector of said second auxiliary transistor to the base of said third switching transistor and supplying thereto a signal which is the inverse of said signal supplied by said first auxiliary transistor to the second switching transistor;

a fourth switching transistor located in a stage higher than said second stage and having emitter, base and a collector; means connecting the collector of said fourth transistor to said second auxiliary transistor for controlling same, and means connecting the base of said fourth switching transistor to a current injector; and the base of the first switching transistor being connectible to a signal input means and a collector of the second switching transistor being connectible to a signal output means.

4,137,466

CONTROLLABLE ELECTRONIC RESISTANCE DEVICE

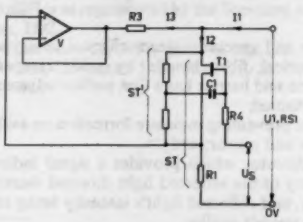
Hans R. Schemmel, and Ingo Reichelt, both of Nuremberg, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 7, 1977, Ser. No. 858,266

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1976, 2655320

Int. Cl.[2] H03K *1/14*

U.S. Cl. 307—264 **6 Claims**



1. An electronic resistance device comprising an amplifier having an input and an output, a first and a second terminal means for applying an input voltage, a voltage divider including a first resistor and a second resistor connected in series between said first and second terminal, means connecting the amplifier input to the junction of said first and second resistors, and a third resistor connecting the amplifier output to said first terminal, said second resistor being adjustable in response to an applied control signal so as to thereby adjust the value of the electronic resistance device between said first and second terminals.

4,137,467

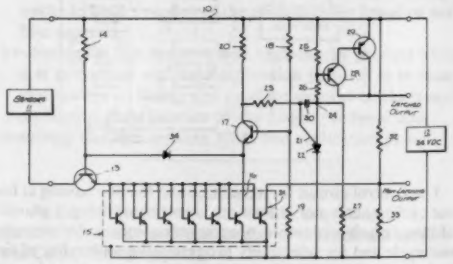
SENSOR INTERFACE CIRCUIT

Richard J. Plog, Peshtigo, Wis., assignor to The Ansul Company, Marinette, Wis.

Filed May 11, 1977, Ser. No. 795,807

Int. Cl.[2] H03K *1/14, 5/00*

U.S. Cl. 307—264 **5 Claims**



1. A circuit for interfacing with sensors having a loop current flowing therethrough comprising:

(a) integrated circuit means having

(i) a plurality of transistors connected as diodes for dividing said loop current into several equal subparts,

(ii) at least one additional transistor connected to said diode-connected transistors so that a current equal to one subpart of said loop current is caused to flow through said additional transistor; and

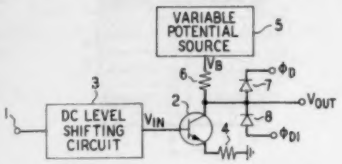
(b) latching means connected to said additional transistor and responsive to said current equal to one subpart of said loop current for developing a latching output signal when said current equal to one subpart of said loop current exceeds a predetermined value.

4,137,468

METHOD AND APPARATUS FOR CORRECTING PULSE TIMING PATTERN

Fridolin L. Bosch, Bethlehem, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 11, 1977, Ser. No. 767,796
Int. Cl.[2] H03 *5/01*
U.S. Cl. 307—268 **11 Claims**



1. A circuit for modifying the timing pattern of pulses as defined by designated time slots comprising:

an input terminal for receiving incoming pulses;

a transistor amplifying stage having its base coupled to said input terminal, its emitter coupled to a reference potential, and its collector coupled to a bias potential and delivering amplified intermediate pulses;

means coupled to said amplifying stage, said means applying a potential to said amplifying stage for selectively shifting the dc potential of said intermediate pulses with respect to a predetermined dc level by an amount such that the resulting widths of the pulses at the predetermined dc level establish a prescribed time shift in relation to said time slots; and

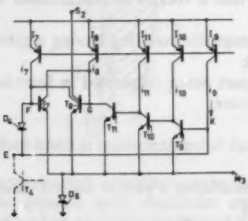
amplitude limiting means coupled to said collector and to a reference potential terminal for limiting the potential of said intermediate pulses a prescribed amount from said predetermined dc level, said limiting means in combination with said shifting means thereby modifying the timing pattern of the circuit output pulses at said predetermined dc level.

4,137,469

THRESHOLD-EFFECT INTEGRATED INJECTION LOGIC CIRCUIT WITH HYSTERESIS

Claude Chapron, Caen, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 16, 1977, Ser. No. 807,041
Claims priority, application France, Jun. 22, 1976, 76 18922
Int. Cl.[2] H03K *3/286, 3/295, 17/30, 19/08*
U.S. Cl. 307—291 **10 Claims**



1. A threshold-effect integrated injection logic circuit with hysteresis comprising:

first and second voltage terminals;

a trigger circuit including an input and an output; a diode having first and second terminals, said first terminal being connected to said input; a first and a second transistor each having an emitter, a base, and one or more collectors, a collector of each transistor being connected to the base of the other transistor, the emitters of said first and said second transistors being connected together and to said first voltage terminal having a first voltage level, said first transistor including a second collector connected to said output, the base of said second transistor being connected to said second terminal of said diode;

a current amplifier comprising n switching transistors, where n is an odd integer, each having an emitter, a base, and one or more collectors, the emitters of said n switching transistors being connected together and being at said first voltage level, said n switching transistors comprising an input transistor having a base connected to said input, a controlled transistor connected to and controlled by said input transistor, having an emitter, a base, and a collector, and an output transistor having a base, an emitter, and a collector, said collector of said controlled transistor being connected to said base of said output transistor, and said collector of said output transistor being connected to the base of said first transistor;

a plurality of current injectors connected to corresponding ones of said switching transistors for supplying current thereto, said current supplied to said input transistor being greater than the current supplied to said controlled transistor; and

interruption means connected between said input and said second voltage terminal having an open state and a closed state;

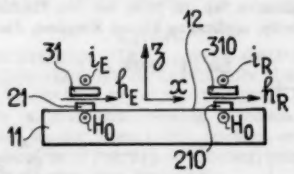
the sum of the internal voltage drop across the said diode and the voltage drop introduced by said interruption means in the closed state being smaller than the sum of said voltage level and the internal voltage drop across the emitter-base junction of said controlled transistor.

4,137,470

MAGNETOSTRICTIVE ELASTIC SURFACE WAVE STRUCTURE

Bernard Désormière, and Gerard Volluet, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 8, 1977, Ser. No. 775,515
Claims priority, application France, Mar. 11, 1976, 76 06906
Int. Cl.[2] H01L *41/14*
U.S. Cl. 310—26 **20 Claims**



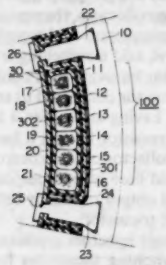
1. A magnetostrictive elastic surface wave structure comprising a non-magnetic substrate and at least one electromechanical transducer arranged on a free major face of said non-magnetic substrate for converting electrical energy into said elastic surface wave and vice-versa; said electromechanical transducer comprising: a deposit of magnetostrictive material overlaying a portion of said major face, electrical conductive means located above said deposit for creating therein an alternating magnetic field in response to said electrical energy and inductor means creating in said deposit a d.c. bias magnetic field; said elastic surface wave being launched by at least one radiating element pertaining to said deposit; the pattern of said element being in the form of one wavefront of said elastic

surface wave and delimited by the geometrical configuration of said deposit.

4,137,471
STATOR WINDING STRUCTURE FOR GAP WINDING TYPE ELECTRIC ROTARY MACHINE

Masaki Sato; Mashatoshi Watanabe; Noriyoshi Takahashi, and Miyoshi Takahashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 20, 1976, Ser. No. 752,100
Claims priority, application Japan, Dec. 25, 1975, 50-156246
Int. Cl.² H02K *5/24*
U.S. Cl. 310—51 **9 Claims**



1. A gap winding type electric rotary machine having a stator core, a rotor core disposed in a bore of said stator core, a stator winding disposed in a cylindrical gap defined between said stator core and said rotor core, and supporting means for fixing said stator winding on the inner surface of said stator core, said stator winding comprising a plurality of coils, characterized in that each of said coils is supported by said supporting means and comprises

a plurality of conductors,

electric insulating means covering and bundling said plurality of conductors,

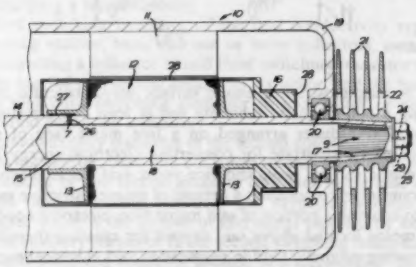
a solid and nonmagnetic casing enclosing said electric insulating means, and

vibration absorbing means disposed between said electric insulating means and said solid and nonmagnetic casing.

4,137,472
COOLING SYSTEM FOR ELECTRIC MOTORS

John Workman, Greyabbey, Northern Ireland, assignor to S.B.W. Engineers Limited, Belfast, Northern Ireland

Continuation of Ser. No. 544,652, Jan. 27, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 724,069
Claims priority, application United Kingdom, Jan. 31, 1974, 04435/74
Int. Cl.² H02K *1/32*
U.S. Cl. 310—61 **17 Claims**

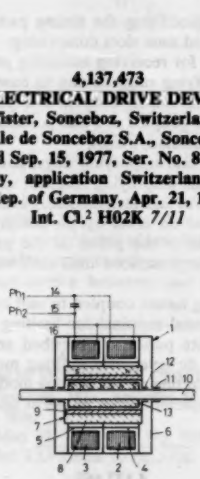


1. An electromagnetic machine rotor assembly comprising a rotor shaft internally accommodating a heat pipe which extends axially therealong and has an evaporating portion and a condensing portion, a rotor mounted on the rotor shaft so that the heat pipe evaporating portion lies within the axial confines of the rotor and the condensing portion lies outwardly of the axial extent of the rotor, a first pocket formed in the end portion of the shaft which is adjacent said heat pipe condensing portion, said first pocket being concentric with the shaft axis and opening into said condensing portion, and being of lesser radial dimension than said condensing portion, whereby said first pocket acts as a trap for non-condensible gases within the heat pipe, a second pocket formed in said shaft end portion and open at one end face thereof, said second pocket being coaxial with said shaft axis, one of said first and second pockets being annular and surrounding the other of said first and second pockets.

4,137,473
ELECTRICAL DRIVE DEVICE

Jean-François Pfister, Sonceboz, Switzerland, assignor to Societe Industrielle de Sonceboz S.A., Sonceboz, Switzerland

Filed Sep. 15, 1977, Ser. No. 833,571
Claims priority, application Switzerland, Sep. 21, 1976, 11938/76; Fed. Rep. of Germany, Apr. 21, 1977, 2717969
Int. Cl.² H02K *7/11*
U.S. Cl. 310—98 **9 Claims**



1. An electrical drive device comprising:

means defining a rotor compartment;

a stator arrangement of the claw pole type and surrounding said rotor compartment and producing therein at least one magnetic field which contains at least one rotary field component;

a permanent magnet rotor arranged in said rotor compartment such that it rotates in synchronism with said magnetic field;

a hysteresis magnetic coupling having a driving part and a driven part;

said driving part being connected in form-locking manner with said rotor;

a shaft;

said driven part being connected in force-locking manner to said shaft;

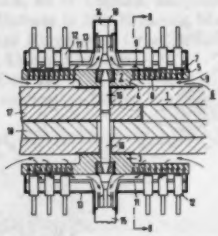
said shaft constituting a power take-off shaft of the drive device; and

said means defining the rotor compartment including a common housing in which there is arranged the stator arrangement, the rotor, the driving part of the hysteresis magnetic coupling and the driven part of said coupling.

4,137,474
GAS-COOLED SLIP RING FOR ELECTRICAL MACHINES

Gerd Krieger, Mülheim, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim, Germany

Continuation of Ser. No. 581,973, May 29, 1975, abandoned.
This application Nov. 17, 1976, Ser. No. 742,637
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1974, 2426823
Int. Cl.[2] H02K 9/28
U.S. Cl. 310—227 3 Claims

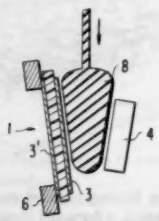


1. Gas-cooled slip ring for mounting on a slip ring shaft of electrical machines comprising a hub having means for mounting the same on the slip-ring shaft in insulating relationship thereto, and a ring flange extending in axial direction from both sides of said hub, said ring flange having a radially outer surface with a multiplicity of mutually adjacent axially spaced radially extending grooves incised therein, and a radially inner surface spaced from the surface of the slip-ring shaft and defining therewith a pair of axially extending ring channels serving as coolant gas supply channels, said ring flange having a plurality of incised notches shaped as substantially circular segments spaced axially along as well as circumferentially about said ring flange and extending from said grooves in radial direction to said ring channels, said incised notches and said radially extending grooves defining direct radial gas flow paths from said ring channels through said ring flange.

4,137,475
THIN FILM, THERMOPLASTIC PIEZOELECTRIC SWITCHES

Masafumi Yoshida, and Naohiro Murayama, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 680,993, Apr. 28, 1976, abandoned. This application Sep. 23, 1977, Ser. No. 835,925
Claims priority, application Japan, Apr. 28, 1975, 50-778
Int. Cl.[2] H01L 41/10
U.S. Cl. 310—323 3 Claims

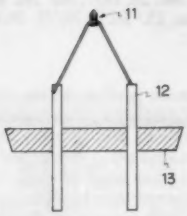


1. A piezoelectric switch comprising a thin film thermoplastic piezoelectric element with electrodes attached to both surfaces thereof, and an oscillator positioned in the vicinity of said element for providing mechanical oscillating energy, at least one of the piezoelectric element and oscillator being movable to a position relative to the other to cause said oscillating energy to be applied to said piezoelectric element with a pressure so as to produce an oscillating piezoelectric field between the electrodes in accordance with changes in the strength of the contact pressure, and an elastic wave absorbing means separate from said oscillator and positioned between said oscillator and said piezoelectric element, said oscillating energy being applied to said piezoelectric element via said absorbing means when both said piezoelectric element and said oscillator are in contact with said absorbing means and said absorbing means absorbing vibrations of the air between said oscillator and said piezoelectric element when either said piezoelectric element or said oscillator are not in contact with said absorbing means.

4,137,476
THERMIONIC CATHODE

Masaji Ishii, Tokyo; Shuzo Watanabe, Kawasaki; Akira Miyai, Machida, and Hideo Hiraoka, both of Machida, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1977, Ser. No. 798,243
Int. Cl.[2] H01J 1/16, 19/10
U.S. Cl. 313—336 9 Claims



1. A thermionic cathode for an electron beam device which comprises a first layer of a single thermoelectron emissive compound sharpened towards a point, a third layer of metal of high melting point and a second layer of reaction barrier material interposed between the first and third layers, said reaction barrier material being selected from one or more of the group consisting of borides and nitrides having high melting points and electrically conducting properties, a first current terminal being directly welded to said third layer and a second current terminal being directly welded to said third layer whereby electric current passes from the first terminal through said third layer to the second terminal.

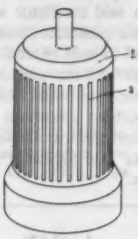
4,137,477
ELECTRODES, FOR EXAMPLE GRID-LIKE ELECTRODES FOR USE IN ELECTRON TUBES, AND A METHOD FOR MANUFACTURING SAME

Johannes W. A. Krol, Valkenswaard, Netherlands; Bernhard Lersmacher, Aachen; Hans Lydtin, Stolberg, and Horst Seifert, Hamburg, all of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1977, Ser. No. 798,315
Claims priority, application Fed. Rep. of Germany, May 28, 1975, 2623828
Int. Cl.[2] H01J 1/46, 17/04, 17/38, 21/10
U.S. Cl. 313—348 8 Claims

1. A method of making a glassy carbon grid electrode for an electron tube comprising the steps of forming a sheet of synthetic resin into a body of a shape corresponding to that of the desired electrode, forming a plurality of grid apertures in said body, gradually heating said body to a temperature between 800° C. and 1000° C. at a rate which is dependent on the thickness of said body and is sufficiently low to maintain a substantially uniform temperature throughout said body during said heating to thereby transform said synthetic resin into glassy

carbon, subsequently heating said body to a temperature of at least 1600° C. at a rate between approximately 100° C. per hour



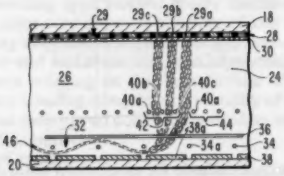
and 200° C per hour, and cooling said body to ambient temperature.

4,137,478

COLOR FLAT PANEL TELEVISION

Thomas L. Credelle, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 20, 1977, Ser. No. 808,294
Int. Cl.[2] H01J *29/72, 29/80*
U.S. Cl. 313—422 **10 Claims**



1. A color image display device comprising:
an evacuated envelope having front and back walls in a spaced, substantially parallel relationship;
a cathodoluminescent screen on the front wall, the screen comprising a plurality of alternating stripes of different color light emitting phosphor materials;
an array of focus wires in a longitudinally spaced, substantially parallel relationship within the envelope substantially parallel to the screen, the spacing between mutually adjacent focus wires within the array being unequal, there being at least as many wires in the array as the number of phosphor stripes,
a source of electrons for the display device; and
a plurality of electron beam guides extending across the screen between the array of focus wires and the back wall for confining electrons from the source into a beam, said guides including means for extracting the beams out of the guides at various points and directing the beams at each extraction point between different pairs of focus wires in the array and onto the corresponding stripes on the screen.

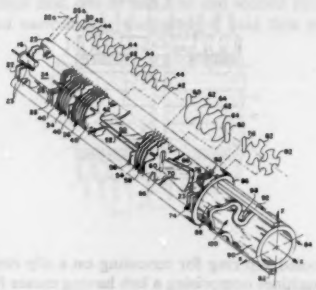
4,137,479

CATHODE RAY TUBE HAVING AN ELECTRON LENS SYSTEM INCLUDING A MESHLESS SCAN EXPANSION POST DEFLECTION ACCELERATION LENS

Bozidar Janko, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jan. 6, 1977, Ser. No. 757,425
Int. Cl.[2] H01J *29/70, 29/62*
U.S. Cl. 313—426 **4 Claims**

1. A cathode ray tube, comprising:
an envelope having a fluorescent screen at one end and an electron gun at another end for producing an electron beam directed toward said screen;
deflection means disposed along a tube axis of said envelope and including elements for deflecting said electron beam in mutually perpendicular directions;
first quadrupole lens means disposed along said tube axis and positioned before said deflection means for focussing said electron beam in mutually perpendicular directions and second quadrupole lens means disposed along said tube axis and positioned between said elements of said deflection means for amplifying the electron beam deflection(s)



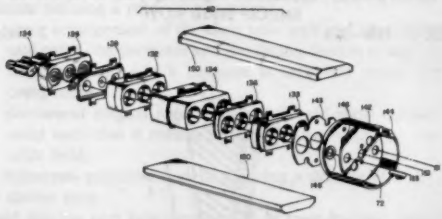
while maintaining the electron beam velocity constant; and
scan expansion post deflection acceleration means disposed along said tube axis between said deflection means and said screen for expanding the scan and simultaneously accelerating said electron beam for impinging onto said fluorescent screen to display an image thereon, said scan expansion post deflection acceleration means including tubular members, at least one of said tubular members having lobular sections positioned relative to each other to provide an accelerating quadrupole lens means.

4,137,480

TELEVISION PICTURE TUBE WITH CATHODE COATING EROSION SUPPRESSION

Alton J. Torre, Wheaton; Michael W. Retsky, Chicago; Norman F. Gioia, Lombard, and Ramesh G. Amin, Itaska, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 31, 1977, Ser. No. 784,478
Int. Cl.[2] H01J *29/94, 9/385*
U.S. Cl. 313—481 **13 Claims**



1. An electron gun having at least one cathode having an electron emissive coating, a forward element and a plurality of electrodes interspaced between said cathode and said forward element, said electrodes and forward element each having at least one aperture wherein said apertures in said electrodes and forward element are coaxial and define at least one beam passageway for passing through said gun a stream of electrons emitted by said cathode during operation, and also wherein said beam passageway unavoidably forms a conduit for high velocity gas when said gun is located in a narrow neck of a

television picture tube and said tube is evacuated of gas through a tubulator located at the rear end of said neck, the improvement comprising a gas influencing element for reducing and perturbing said high velocity gas flow in said conduit at least in the region of said cathode as said tube is evacuated to suppress erosion of said cathode coating by preventing a violent flow of gas over said cathode.

4,137,481

ELECTROLUMINESCENT PHOSPHOR PANEL

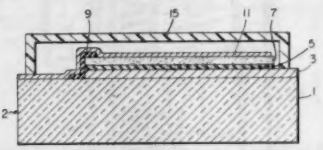
Cyril Hilsum; John Kirton, both of Malvern, and Adrian L. Mears, Cheltenham, all of England, assignors to The Secretary of State of Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, United Kingdom

Filed Oct. 18, 1977, Ser. No. 843,188

Claims priority, application United Kingdom, Oct. 29, 1976, 45213/76

Int. Cl.[2] H05B *33/02, 33/14*

U.S. Cl. 313—503 **11 Claims**



1. An electroluminescent phosphor panel suitable for unidirectional voltage operations comprising in serial order, a transparent electrically insulating substrate, a transparent first electrode film, a first layer of semi-insulating activator doped phosphor with an average thickness less than 5 microns, a second layer of an electrically conducting phosphor, and a second electrode film.

4,137,482

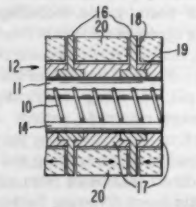
PERIODIC PERMANENT MAGNET FOCUSED TWT

George Caryotakis, Menlo Park; George Chan, San Mateo; Louis R. Falce, Redwood City, all of Calif.; William R. Luebke, deceased, late of Redwood City, Calif. (by Robin N. Luebke, executrix), and Walter Wood, San Jose, Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed May 12, 1977, Ser. No. 796,274

Int. Cl.[2] H01J *25/34*

U.S. Cl. 315—3.5 **7 Claims**



1. In a traveling wave tube, means to permit focusing a linear electron beam comprising:

a thin-walled, non-magnetic metallic tubular cylinder surrounding said beam and forming part of the vacuum envelope of said tube, said cylinder being vacuum-tight and being adapted and dimensioned to accommodate said beam passing therethrough,

a plurality of rings stacked along the axis of said cylinder, each having a central opening fitting around said cylinder,

said rings being alternately of magnetic and non-magnetic metal,

said magnetic rings having external surfaces adapted to mate with permanent magnet members to couple magnetic flux between successive magnetic rings,

said rings and said cylinder being mutually joined together to form a unitary mechanically rigid structure.

4,137,483

HIGH PRESSURE DISCHARGE LAMP WITH A STARTING CIRCUIT CONTAINED THEREIN

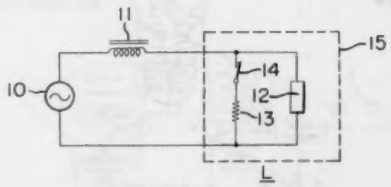
Masafumi Ochi, Kitamoto; Motonobu Masui, Kumagaya, and Ikuo Iwai, Ohmiya, all of Japan, assignors to Iwasaki Electric Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1976, Ser. No. 747,019

Claims priority, application Japan, Dec. 2, 1975, 50-142398

Int. Cl.[2] H01J *7/24*

U.S. Cl. 315—74 **8 Claims**



1. A high pressure discharge lamp connected to a power supply by an inductive reactance element, comprising a hermetically sealed light emitting tube provided with a pair of opposed electrodes, the interior of the light emitting tube being filled with at least a luminous metal and gas, a series starting circuit including a normally closed thermoresponsive switch and a resistor in series shunted across said electrodes, and an evacuated outer envelope containing therein said series starting circuit and said light emitting tube, the resistance value of said resistor being set such that: (1) a current flows through said series starting circuit sufficient to open said thermoresponsive switch in response to heating of said resistor before a discharge is started between said electrodes and sufficient to induce across said reactance element a pulse of voltage higher than the starting voltage of said lamp when said thermoresponsive switch opens, thereby to start a discharge between the electrodes, and (2) the current flowing through said series starting circuit is substantially equal to or less than the lamp current during the stable state of the lamp, whereby the pulse energy is insufficient to damage the reactance element, and the current through the switch is insufficient to damage the switch when it opens.

4,137,484

COLOR IMPROVEMENT OF HIGH PRESSURE SODIUM VAPOR LAMPS BY PULSED OPERATION

Mitchell M. Osteen, Zirconia, N.C., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 649,900, Jan. 16, 1976, abandoned. This application Jun. 13, 1977, Ser. No. 806,301

Int. Cl.[2] H05B *37/02, 39/04, 41/36*

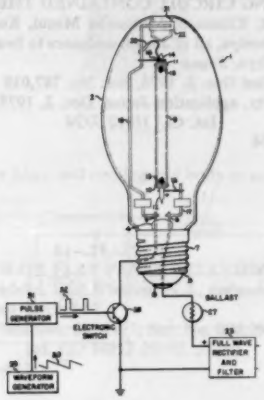
U.S. Cl. 315—209 R **39 Claims**

1. A method of operating a high pressure metal vapor lamp of a kind having a filling of sodium within an envelope provided with spaced electrodes and proportioned to produce, at a rated power input, a sodium vapor pressure causing self-reversal and broadening of the sodium resonance D lines which method comprises:

energizing said lamp by electrical pulses producing approximately said rated power input, said pulses having a rise rapid enough and a time-duration short enough to produce, in addition to the light resulting from the self-reversal and broadening of the sodium D lines, substantial light

in the blue-green side of the spectrum whereby the color temperature is increased.

13. In combination, a high pressure metal vapor lamp of a kind having a filling of sodium within an envelope provided with spaced electrodes and proportioned to produce, at a rated power input, a sodium vapor pressure causing self-reversal and broadening of the sodium resonance D lines, and means for



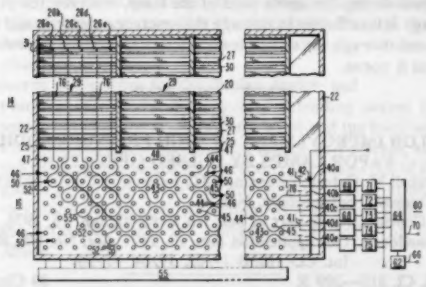
energizing said lamp comprising a generator of electrical pulses connected across said electrodes, said generator producing approximately said rated power input, said pulses having a rise rapid enough and a time-duration short enough to produce, in addition to the light resulting from the self-reversal and broadening of the sodium D lines, substantial light in the blue-green side of the spectrum whereby the color temperature is increased.

4,137,485

IMAGE DISPLAY BLOCK SCANNING METHOD

John A. van Raalte, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 1, 1977, Ser. No. 783,654
Int. Cl.[2] H01J *29/70, 29/72*
U.S. Cl. 315—366 **8 Claims**



1. A method for scanning a line of an image in a display device having a cathodoluminescent screen and X number of first electron beam guides each of which periodically confines an electron beam as it travels along the guide, said guides being divided into groups, each of which consists of Y number of guides, said method comprising the steps of:

generating Y number of electron beams;

modulating each of said electron beams with image information;

sequentially directing said electron beams into each group of first beam guides so that each beam is directed into only one guide in each group; and

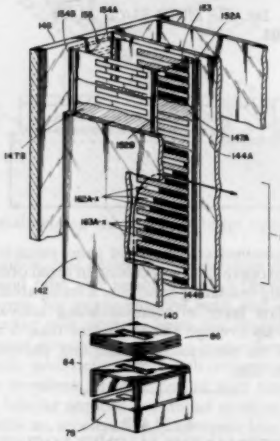
deflecting each beam out of the first beam guides and toward the cathodoluminescent screen.

4,137,486

ELECTRON BEAM CATHODOLUMINESCENT PANEL DISPLAY

James W. Schwartz, Deerfield, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 735,465, Oct. 26, 1976. This application Apr. 25, 1978, Ser. No. 899,933
Int. Cl.[2] H01J *29/70, 29/72*
U.S. Cl. 315—366 **7 Claims**

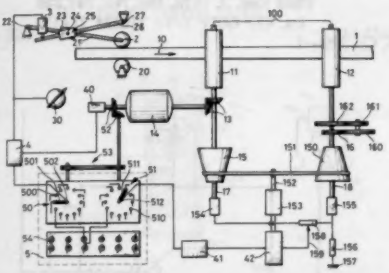


1. An image display panel comprising an evacuated envelope having a back wall, side walls, and a faceplate having an anode and an ordered array of rows and columns of phosphor targets deposited on an inner surface thereof, said panel including electron beam generating means disposed along an edge of said panel, said beam being directed into a beam guide comprising a substantially rectangular column having a pair of opposed parallel walls substantially perpendicular to said back wall and said faceplate, said beam guide including beam-confining means for restricting egress of said beam from said beam guide, said panel including beam-diverting means comprising at least one electrode pattern disposed on each of said opposed parallel walls, each of said patterns being electrically linked to a substantially mirror-image electrode pattern deposited on the opposed parallel wall to comprise a pair, the pairs of electrode patterns having a configuration, spacing and electrical energization effective to divert said beam from said beam guide by means of electrostatic beam-diverting fields, the pairs of electrode patterns for each row each comprising an array of parallel strips once-divided into conductive and resistive segments of successively varying apportionment, said conductive segments being adapted to receive a predetermined first potential and the respective distal ends of said resistive segmemts being adapted to receive a predetermined second potential which is negative with respect to said first potential such that the voltage drop across said resistive segments produces across the path of said beam in cooperation with the opposed mirror-image electrode pattern, a family of equipotential surfaces defining electron-refractive fields for diverting said beam from said beam-confining means of said beam-guide towards said faceplate.

4,137,487
METHOD AND DEVICE FOR AUTOMATICALLY LEVELING FLEECES, SLIVERS, ROVINGS AND THE LIKE BY DRAWING

Heinrich Niestroj, Ingolstadt, and Peter Denz, Hohenwart, both of Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Sep. 27, 1976, Ser. No. 726,737
Claims priority, application Fed. Rep. of Germany, Oct. 2, 1975, 2544029
Int. Cl.[2] D01H *5/38*; G05B *19/28*
U.S. Cl. 318—39 6 Claims

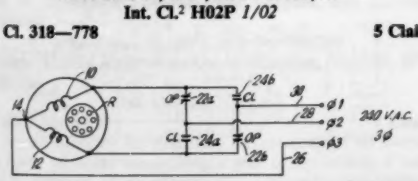


1. A device for automatically leveling a band of fibers such as fleeces, slivers, roving and the like by varying the drafting speed of a drafting mechanism, said device comprising:
   a. means for sensing the thickness of said band of fibers before said band of fibers are fed into said drafting mechanism and generating an analogue voltage corresponding thereto,
   b. an analogue to digital converter converting said analogue voltage to a digital signal,
   c. storage means for storing said digital signal,
   d. said storage means for storing said digital signal including,
      i. a digital value stepping storage register, and
      ii. means for stepping said storage register in synchronism with said drafting speed,
   e. means for reading out said stored digital signal from said storage means after a predetermined period of time,
   f. means for converting said digital signal after being read-out to a converted analogue signal,
   g. means for varying the drafting speed of said drafting mechanism with said converted analogue signal in order to level said band of fibers, and
   h. said means for stepping said storage register in synchronism with said drafting speed includes,
      i. an impulse generator operably connected to said drafting mechanism for generating pulses having a frequency corresponding to the drafting speed.

4,137,488
MODIFIED INDUCTION MOTOR FOR USE IN A THREE PHASE POWER SYSTEM

Dan Sibalis, 90 Gold St., New York, N.Y. 10038

Filed Jan. 18, 1977, Ser. No. 760,461
Int. Cl.[2] H02P *1/02*
U.S. Cl. 318—778 5 Claims

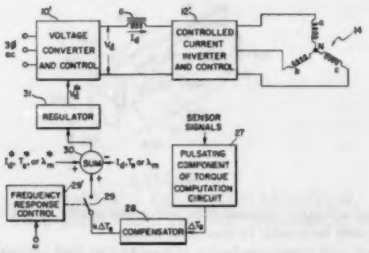


1. An electric motor arrangement comprising a motor including a rotar and no more than first and second stator windings connected at a junction point, first means for operatively connecting on line of a three-phase power system to an end of one of said windings, second means for operatively connecting a second line of said three-phase power system to an end of the other of said windings, and third means for operatively connecting a third line of said power system to said junction of said windings, said first and second connecting means comprising a pair of alternately operable relay contacts.

4,137,489
FEEDBACK CONTROL FOR REDUCTION OF COGGING TORQUE IN CONTROLLED CURRENT AC MOTOR DRIVES

Thomas A. Lipo, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,626
Int. Cl.[2] H02P *5/40*
U.S. Cl. 318—798 9 Claims



1. In a control system for a controlled current motor drive comprising a voltage converter which is connected by way of a dc link including a smoothing inductor to a controlled current inverter for producing output current with the dc link current magnitude and a variable frequency to be fed to an ac motor, the control system including means for varying the magnitude of the voltage applied to the dc link by said voltage converter, improved means for reducing cogging torque in said motor comprising

means for generating a change of instantaneous torque feedback signal that is a function of only the instantaneous pulsating component of electromagnetic torque and which has no dc component, and

means for providing said change of torque feedback signal as a correction term to said means for varying the magnitude of the voltage applied to the dc link to thereby effect a reduction in cogging torque pulsations.

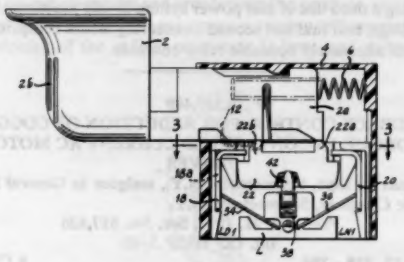
4,137,490
TRIGGER SPEED CONTROL SWITCH

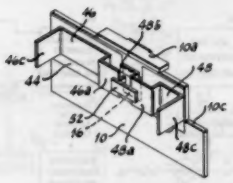
Daniel J. Brozoski, Franksville, and Pupak T. Pupak, Menomonee Falls, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Nov. 8, 1977, Ser. No. 849,676
Int. Cl.[2] H02P *5/16*
U.S. Cl. 318—345 G 8 Claims

1. A trigger speed control comprising:
   an insulating housing having switch contacts and a variable resistor mounted therein;
   a spring-biased trigger mounted for movement in said housing and normally extending therefrom for depression by the user to close said switch contacts and to operate said variable resistor;
   and a speed control circuit subassembly in said housing comprising:
   a heat sink and means connecting it to said variable resistor;
   a thyristor having its anode side soldered to said heat sink;
   a double-sided adhesive insulating film stuck to said heat sink adjacent to said thyristor;

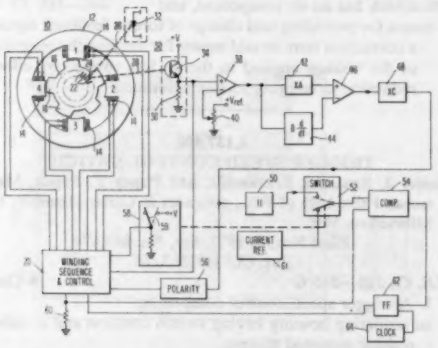
a pair of terminals stuck to said film and having end portions contacting the gate and cathode of said thyristor;
a chip capacitor soldered across said terminals;





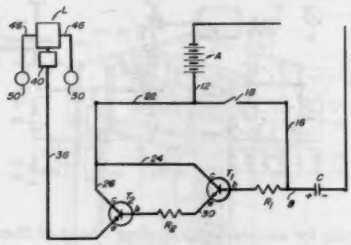
said adhesive on said film being thermoset to securely bond said terminals to said heat sink;
and said terminals being connected to said variable resistor and said contacts to provide a trigger speed control circuit capable of variable motor speed control by trigger depression.

4,137,491
STEPPER MOTOR WITH ANALOG POSITIONING
George S. Bartley, Harleysville, and Stanley N. Brunner, Downington, both of Pa., assignors to Exxon Research & Engineering Co., Florham Park, N.J.
Filed Sep. 14, 1977, Ser. No. 833,266
Int. Cl.[2] G05B 19/40
U.S. Cl. 318—685 **13 Claims**



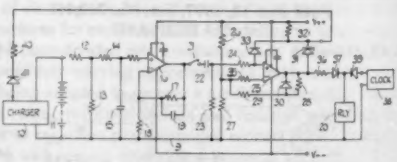
10. A method of modifying the step positions of a stepper motor comprising a movable magnetic structure, a stationary magnetic structure and a plurality of windings associated with one said structure at a plurality of pole positions, said movable magnetic structure being inherently capable of moving in magnetically determined steps relative to said stationary structure in response to selective energization of said windings, said method comprising the following steps:
sensing the location of the movable magnetic structure;
determining the distance between a location on the movable magnetic structure and a predetermined stop position differing from any of said magnetically determined steps;
selectively energizing the windings of said motor so as to reduce said distance in response to the determined distance; and
stopping said location of said movable magnetic structure substantially at said predetermined position.

4,137,492
STORED ENERGY MODULE
Forrest O. E. Schultz, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Dec. 3, 1976, Ser. No. 747,245
Int. Cl.[2] G05F 1/46; H02M 3/155
U.S. Cl. 320—1 **1 Claim**



1. A stored energy module including a battery, a switch, a capacitor and a transistor having a base, collector and emitter, said capacitor being series connected with said transistor for applying a forward bias from said base to said emitter, said battery being connected with said collector for applying a reverse bias from said collector to said base and for supplying current to a load only through said transistor from said collector to said emitter, said battery being connected through said switch between said capacitor and transistor for charging said capacitor and applying a forward bias from said base to said emitter when said switch is closed, said capacitor being connected to no other voltage source except said battery and being connected thereto only as aforesaid through said transistor or through said switch, and said battery being connected with the load only as aforesaid through said transistor.

4,137,493
BATTERY CHARGE DETECTOR AND CHARGING SYSTEM INCLUDING SUCH DETECTOR
Sidney B. Smith, Hemel Hempstead, England, assignor to Lucas Industries Limited, Great Britain
Filed Nov. 3, 1976, Ser. No. 738,550
Claims priority, application United Kingdom, Nov. 8, 1975, 46294/75
Int. Cl.[2] H02J 7/04
U.S. Cl. 320—39 **15 Claims**



1. A detector for use in the control of charging of a secondary battery comprising an input circuit for connection to a battery being charged and producing an output voltage dependent on the battery voltage and detector means sensitive to said output voltage and arranged to provide an output signal when

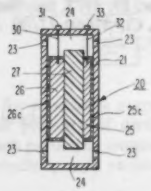
said output voltage starts to fall, said detector means comprising a capacitor and a resistor in series, a switch for periodically connecting the input circuit to the capacitor, and a comparator for comparing the voltage across the resistor with a reference voltage.

4,137,494

APPARATUS AND METHOD FOR ANALYZING OIL CONTENT OF WATER

Frank Malley, Gloucester, and Raymond F. Akers, Mantua, both of N.J., assignors to Delray Electronics Inc., Westville, N.J.

Filed Feb. 25, 1977, Ser. No. 772,071
Int. Cl.[2] G01N *27/12*
U.S. Cl. 324—30 R **14 Claims**



1. An oil content analyzing apparatus, comprising:
   a. a housing having openings for water flow therethrough, said water having at least trace amounts of oil therein;
   b. first and second electrode elements positioned within said housing, said elements being of dissimilar metallic composition;
   c. oil absorbing accumulating means positioned between said electrodes for absorbing and accumulating trace amounts of oil from water flowed therethrough; and
   d. output means connected to said electrodes for providing outside of said housing an output signal which is a function of the accumulated oil absorption of said accumulating means.

12. A method of analyzing the oil content of water, the method utilizing a detector having a degradable ion transport membrance sandwiched between two electrodes, comprising the steps of:
   obtaining a sample of said water containing trace amounts of oil therein,
   flowing said sample containing trace amounts of oil through said membrane,
   accumulating oil from said oil in said membrane,
   recirculating said sample through said membrane until substantially all of said trace amounts of oil have been accumulated in said membrane, and
   detecting the electrical output generated across said electrodes, which output varies as a function of said accumulation such that said detected output is a predetermined function of said accumulation.

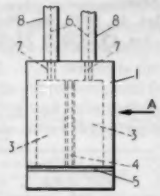
4,137,495

OIL DETECTOR

David M. B. Brown, 1 Milton Park, Colyton, Ayr, Ayrshire, Scotland

Filed Mar. 25, 1977, Ser. No. 781,352
Claims priority, application United Kingdom, Mar. 27, 1976, 39885/76
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—30 B **9 Claims**

1. An oil detector for detecting the presence of oil floating on a body of water comprising a pair of electrodes, a body member formed of an electrically nonconductive material having a capillary channel therein extending at least between said electrodes and communicating therewith, a bore formed in said body member extending therethrough and intersecting said channel to facilitate the entry of water into said channel when the detector is immersed in water, and means for electrically connecting said electrodes to a measuring circuit, said



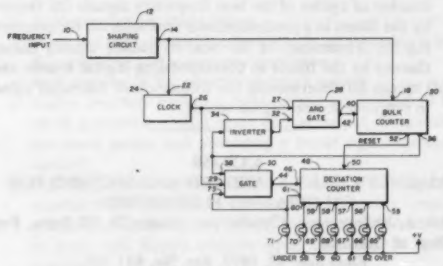
capillary channel being on an external face of said body member and being exposed to the body of water and being open to receive a water-oil mixture.

4,137,496

LINE FREQUENCY DEVIATION MONITOR

LeRoy R. Lind, 10038 Cedar Lake Rd., Minnetonka, Minn. 55343

Filed Sep. 16, 1977, Ser. No. 833,735
Int. Cl.[2] G01R *23/02*
U.S. Cl. 324—78 Z **7 Claims**



1. A frequency meter for measuring the deviation of an alternating current signal from a nominal frequency comprising:
   a clock generator for producing a train of pulses having a period at least 100 times shorter than those of the nominal frequency;
   means for generating a first logic signal when said alternating current signal has a first polarity value and a second logic signal when said signal has a second polarity;
   counter means connected to receive pulse inputs from said clock generator and also connected to receive signals from said means for generating said first and second logical signals, said counter means operative to count said pulses from said clock generator only when said second logic signal is applied thereto; and
   display means connected to receive an indication from that stage of said counter means which will be reached when the period of said alternating current signal has its nominal value, said display means operative to produce a tangible indication when the frequency of said input signal is equal to the nominal frequency.

4,137,497

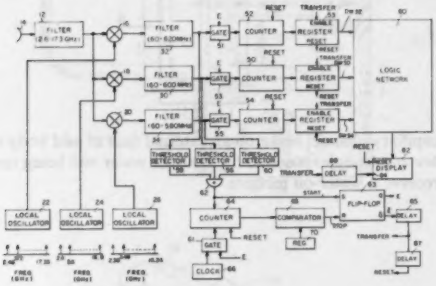
FREQUENCY MEASURING APPARATUS

Oscar Lowenschuss, Goleta, Calif., assignor to Raythoon Company, Lexington, Mass.

Filed Oct. 31, 1977, Ser. No. 847,381

Int. Cl.[2] G01R *23/02*

U.S. Cl. 324—78 F **12 Claims**



1. Frequency measuring apparatus, comprising:

(a) means for mixing an input signal with sets of signals producing a plurality of groups of beat frequency signals, each group of beat frequency signals being produced by mixing the input signal with a corresponding one of a plurality of sets of harmonic signals, such sets of harmonic signals being harmonic signals of different fundamental frequency signals;

(b) a plurality of filters, each one being fed by a corresponding one of the groups of beat frequency signals, for rejecting the beat frequency signals in such groups having frequencies greater than different predetermined frequencies;

(c) counter means, coupled to the filters, for counting the number of cycles of the beat frequency signals fed thereto by the filters in a predetermined time interval for converting the frequencies of the beat frequency signals passed thereto by the filters to corresponding digital words; and

(d) means for determining the frequency of the input signal in response to the digital words.

4,137,498

MAGNETIC FLUX STANDARD AND METHOD FOR CALIBRATING FLUXMETERS

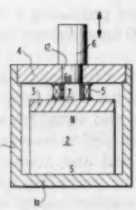
Erich A. Steingroever, Flensburger Strasse 33, 53 Bonn, Fed. Rep. of Germany

Filed Jun. 30, 1977, Ser. No. 811,715

Claims priority, application Fed. Rep. of Germany, Nov. 15, 1976, 2651999

Int. Cl.[2] G01R *35/00*

U.S. Cl. 324—202 **18 Claims**



1. Apparatus for the calibration of flux measuring instruments comprising:

a. means for establishing a magnetic circuit including an air gap, said circuit having a predetermined constant field strength across said air gap;

b. a saturable calibrating element to be magnetically saturated by said field;

c. means for inserting said calibrating element into said air gap in a reproducible position, and;

d. sensing means disposed in said air gap, and being responsive to changes in flux resulting from insertion of the calibrating element into said air gap to generate corresponding changes in electrical values at its output;

whereby the change in value of the electrical output resulting from insertion of said calibrating element into the air gap provides a standard value for calibrating an instrument.

4,137,499

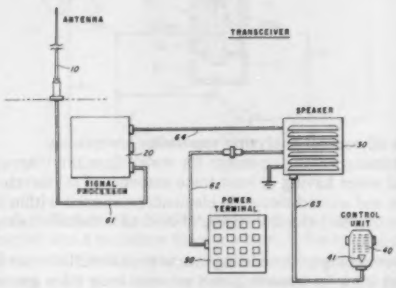
SIGNAL STRENGTH MEASURING TRANSCEIVER

Edward R. Caudel, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 27, 1977, Ser. No. 791,265

Int. Cl.[2] H04B *17/00, 1/40*

U.S. Cl. 325—67 **13 Claims**



1. A radio transceiver having means for measuring the signal strength of its radio wave signal transmissions, said transceiver comprising:

(a) transducer means for converting audio information to be transmitted by said transceiver into audio electrical signals;

(b) frequency generator means for generating a reference frequency signal to be transmitted by said transceiver;

(c) a transmitter section having a signal input including an antenna means, said transmitter section for transmitting radio wave signals on said antenna means in accordance with signals applied to said signal input;

(d) electrically controllable switch means coupling said transducer means and said frequency generator means to said signal input, said switch means being controllable to alternately apply said reference frequency signal and said audio electrical signals to said transmitter section to be transmitted via said antenna means;

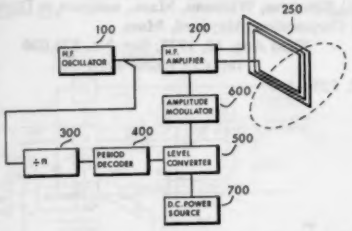
(e) standing wave sensing means coupled to said antenna means for generating first digital signals indicative of the magnitude of foward traveling voltage waveforms on said antenna means and for generating second digital signals indicative of the magnitude of reverse traveling voltage waveforms on said antenna means; and

(f) digital processor means for controlling the operation of said transceiver, said digital processor means being coupled to said electrically controllable switch means for controlling said switch means to transmit a radio wave signal indicative of said reference frequency for a predetermined time period prior to transmission of radio wave signals containing audio information and being coupled to said standing wave sensing means for receiving said first and second digital signals and calculating signal strength based upon the first and second digital signals generating during the transmission of said reference frequency signal.

4,137,500
FREQUENCY DEPENDENT AMPLITUDE MODULATED EXCITER APPARATUS

Harold J. Weber, 20 Whitney Dr., Sherborn, Mass. 01770

Filed Dec. 7, 1976, Ser. No. 748,373
Int. Cl.[2] H04B 1/04
U.S. Cl. 325—141 12 Claims



12. Exciter means for producing output signal pulses composed of a sequential plurality of distinctly different pulse amplitudes wherin each particular amplitude component has a precisely defined periodicity, said exciter including in operative combination:

a. input means connectable to a source of D.C. voltage for receiving operating current and voltage therefrom;

b. generative means coupled to said input means and operative to develop first frequency oscillations in response to connection to said source of D.C. voltage;

c. counter means coupled to said generative means including a plurality of flip-flops arranged in a binary sequential circuit that includes several outputs therefrom which are caused to proceed cyclically through a set of stable binary states in response to a series of said first frequency oscillations;

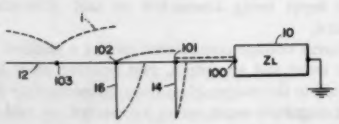
d. combinatorial switching network means coupled to said counter means and responsive to said set of stable binary states so as to be concurrently operative to produce a plurality of unique seconds signal pulse rates, exhibiting harmonic relationship, at each of several outputs;

e. level converter means coupled to the said several outputs provided by the said combinatorial switching network means and operative to produce at a common summing point output terminal a pulse train comprising a sequence of pulses of different instantaneous voltage amplitudes wherein each amplitude corresponds, respectively, to a different combination of plural second pulse trains.

4,137,501
NOISE SUPPRESSION DEVICE

Yoshitaka Kuroyanagi, and Tatsuo Teratani, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Sep. 2, 1976, Ser. No. 719,930
Claims priority, application Japan, Apr. 7, 1976, 51-39760
Int. Cl.[2] H04B 1/18
U.S. Cl. 325—313 5 Claims



1. A noise suppression device for suppressing noise currents in an electrical circuit in motor vehicles comprising:

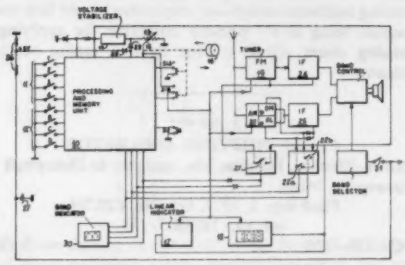
a first wire electrically coupled to an arbitrarily chosen point on said circuit thereby creating a standing wave pattern of noise current on said circuit; and

a second wire electrically coupled to a node of said standing wave pattern thereby substantially reducing the magnitude of the noise current, each of said first and second wires having an open end and a length equal to $\lambda/4 + \lambda/2 \times n$ (n=0, 1, 2, . . .), where is the wave length of the noise current to be suppressed, said first and second wires are disposed along and substantially in parallel to said circuit on the side where high frequency currents occur.

4,137,502
RADIO-RECEIVER OR TUNER PROVIDED WITH SOLID STATE MEMORIZING MEANS FOR A MULTIPLICITY OF RECEPTION FREQUENCIES

Ciro Maddaloni, Rome, Italy, assignor to Voxson S.p.A., Italy

Filed Apr. 27, 1977, Ser. No. 791,251
Claims priority, application Italy, May 3, 1976, 49305 A/76
Int. Cl.[2] H04B 1/26
U.S. Cl. 325—455 13 Claims



1. A receiver-tuner comprising:

first control means capable alternatively of assuming a manual condition and a memory condition;

a clock generator for generating clock pulses;

a binary counter, having a count input connected to said clock generator, a reset input, and an output, for counting the clock pulses and providing a count signal indicative thereof;

momentary contact control means normally assuming a first condition and capable of momentarily assuming a second condition and connected to said binary counter reset input to reset said binary counter upon assuming its second condition;

a digital-to-analog converter resistance network connected to said binary counter output for generating an analog count signal voltage indicative of the binary counter count signal;

a variable voltage generator for generating a control voltage and including means for selecting the level of the control voltage;

a voltage comparator having a first input connected to said variable voltage generator, for receipt of the control voltage therefrom, and having a second input connected to said resistance network, for receipt of the analog count signal voltage therefrom, for providing a first comparator output indication when the control voltage is greater than the count signal voltage and providing a second output indication when the control voltage is less than the count signal voltage;

further control means connected to said first control means, to said momentary contact control means, to said voltage comparator, and to said clock generator and responsive to said momentary contact control means assuming its second condition while said first control means is in its memory condition to activate said clock generator to start generation of clock pulses, and responsive to said voltage

comparator second output indication to deactivate said clock generator to stop generation of clock pulses;

a digital memory having a plurality of storage locations, for storing signals indicative of a plurality of reception frequencies, and of a plurality of reception bands;

manual key means coupled to said digital memory for selecting one of said plurality of storage locations;

means coupling said binary counter output to said digital memory and responsive to actuation of said key means in a first meanner to select one of said plurality of storage locations and to write the count signal provided by said binary counter at the time said voltage comparator provides the second output indication into that selected one of said plurality of storage locations;

means coupling said digital memory to said resistance network and responsive to activation of said key means in a second manner to select one of said plurality of storage and locations and to apply the count signal stored in that selected one of said plurality of storage locations to said resistance network;

variable tuning reactance means; and

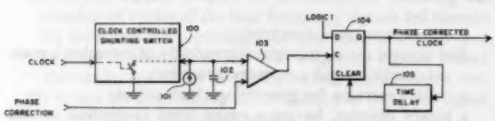
means responsive to said first control means being in its manual condition for applying the control voltage to said tuning reactance means and responsive to said first control means being in its memory condition for applying the analog count signal voltage to said tuning reactance means.

4,137,503

PHASE SHIFTING APPARATUS

Randall A. Ziesmer, Pinellas, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 1, 1977, Ser. No. 829,706
Int. Cl.[2] H03K 5/153
U.S. Cl. 328—155 **9 Claims**



1. A controlled phase shifter having a timing signal input and a control signal input, said timing signal input adapted to receive a periodic timing signal of a selected period, said voltage controlled phase shifter comprising:

a period timing means having a period timing means output, said period timing means being capable of providing at said period timing means output, in each said selected period and in response to said periodic timing signal, a periodic phase delay signal each of which is a single-valued function of phase in its corresponding said selected period for a significant portion of that said corresponding selected period;

a comparator means having first and second comparison inputs and a comparator means output, said first comparison input connected to said period timing means output and said second comparison input serving as said control signal input, said comparator means being capable of providing a comparator means output signal level shift at said comparator means output thereof when said periodic phase delay signal sufficiently exceeds a control signal applied to said control signal input; and

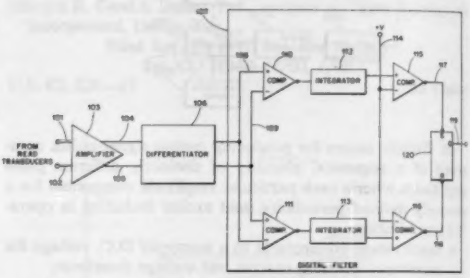
a duty cycle determination means having a duty cycle determination means input and a duty cycle determination means output and a duty cycle determination means input connected to said comparator means output, said duty cycle determination means being capable of providing and occurrence indication, at said duty cycle determination means output, that a said comparator means output signal level shift has occurred and being capable of providing a determination indication when a selected fraction of a said selected period has elapsed after each occurrence of said occurrence indication.

4,137,504

DIGITAL FILTER

Elmer C. Simmons, Whitman, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Aug. 12, 1977, Ser. No. 824,030
Int. Cl.[2] H03K 1/10
U.S. Cl. 328—165 **4 Claims**



1. A filter circuit for electrically processing a voltage waveform having positive and negative portions, wherein information is contained in the pattern and spacing of zero-voltage crossings, to eliminate false zero crossings caused by noise, said circuit comprising;

a. a first voltage comparator having positive and negative inputs, said first comparator producing an output when a voltage present at said positive input exceeds a voltage present at said negative input;

b. means for connecting said voltage waveform to said positive input of said first comparator;

c. means for connecting the inverse of said voltage waveform to said negative input of said first comparator means;

d. a second voltage comparator having a positive and negative input, said second comparator producing an output when a voltage present at said positive input exceeds a voltage present at said negative input;

e. means for connecting said voltage waveform to said negative input of said second comparator;

f. means for connecting the inverse of said voltage waveform to said positive input of said second comparator;

g. first integration means responsive to an output produced by said first comparator for generating a linearly increasing voltage waveform;

h. second integration means responsive to the output of said second comparator for producing a linearly increasing voltage waveform;

i. a reference voltage source;

j. a third voltage comparator having a positive and negative input and an output, said positive input being connected to the output of said first integration means, and said negative input being connected to said reference voltage source;

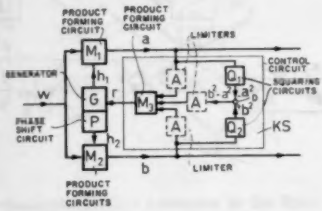
k. a fourth voltage comparator having a positive and negative input and an output, said positive input being connected to the output of said second integration means, and said negative input being connected to said reference voltage source; and

l. a set-reset flip-flop having a set input and a reset input, said set input being connected to said output of said third comparator and said reset input being connected to said output of said fourth comparator.

4,137,505
METHOD OF AND APPARATUS FOR FREQUENCY CONTROL

Gustav Guanella, Zurich, Switzerland, assignor to Patelhold Patentverwertungs- & Holding AG, Glaurus, Switzerland

Filed Apr. 8, 1976, Ser. No. 674,890
Claims priority, application Switzerland, Apr. 16, 1975, 4818/75
Int. Cl.[2] H03D *3/06*
U.S. Cl. 329—124 34 Claims

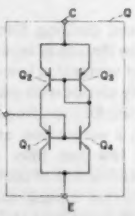


1. A demodulator for a phase keyed carrier comprising:
means for providing first and second frequency signals having a substantially constant phase difference therebetween;
first means for mixing the modulated carrier with one of said first and second signals;
second means for mixing the modulated carrier with the remaining one of said first and second frequency signal;
means for combining the outputs of said first and second mixers for generating a control signal coupled to said providing means for regulating at least one of said first and second frequency signals product-forming means for forming the products of the outputs of said first and second mixer means; said means for combining further including a sum-forming circuit coupled between said first and second mixers and said combining means and a difference-forming circuit coupled between said first and second mixers and said combining means to respectively couple the sums and the differences of the mixer outputs to said product-forming means.

4,137,506
COMPOUND TRANSISTOR CIRCUITRY

Masayuki Iwamatsu, and Kenji Yokoyama, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 27, 1977, Ser. No. 846,021
Claims priority, application Japan, Nov. 11, 1976, 51/151431[U]
Int. Cl.[2] H03F *3/04*
U.S. Cl. 330—288 9 Claims

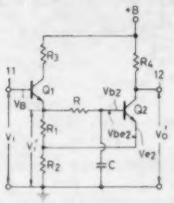


1. A compound transistor circuit comprising:
a first, a second and a third terminal,
first, second and third bipolar transistors of a first conductivity type, and
a fourth bipolar transistor complementary at least to said first transistor,
said second and third transistors having their respective emitters coupled together to said first terminal, a base of said second transistor and a collector of said third transistor being connected together to a collector of said fourth transistor, a base of said third transistor being connected to the collector of said third transistor, bases of said first and fourth transistors being connected in common to said second terminal, an emitter of said first transistor being connected to a collector of said second transistor, a collector of said first transistor and an emitter of said fourth transistor being connected together to said third terminal.

4,137,507
PHASE-SHIFTING CIRCUIT

Yutaka Haramoto, Zama; Yasuhiko Fujii, Yokohama, and Masami Yamazaki, Zama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 6, 1977, Ser. No. 785,213
Claims priority, application Japan, Apr. 12, 1976, 51-41064; Jun. 4, 1976, 51-72227
Int. Cl.[2] H03F *3/04*
U.S. Cl. 330—302 8 Claims



1. A phase-shifting circuit comprising: first and second resistors of equal resistance values connected in series, one end of the series connection of the first and second resistors being connected to a reference voltage point, and the other end of the series connection being applied substantially with an input signal; a third resistor connection at one terminal thereof to said other end of the series connection; a capacitor connected between an other terminal of the third resistor and the reference voltage point; and a circuit receiving a first signal voltage obtained from said other terminal of the third resistor and a second signal voltage obtained from the junction between the first and second resistors for producing an output signal which is proportional to a difference voltage between said first and second signal voltages.

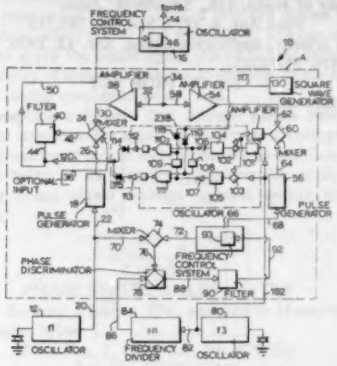
4,137,508
CHANNEL SELECTION SYSTEM FOR A DISPLACED SPECTRUM FREQUENCY SYNTHESIZER

Eduard H. Hugenholtz, 16 Brucedale Crescent, Willowdale, Ontario, Canada (M2K 2C7)

Filed Jun. 30, 1977, Ser. No. 811,710
Int. Cl.[2] H03B *3/08*
U.S. Cl. 331—4 14 Claims

1. In a phaselock device, having a variable first oscillator, to be phaselocked to a predetermined harmonic of a second signal source having a frequency spectrum, the improvement comprising a comparator discriminator control system to move the frequency of said first oscillator from a condition of phaselocked coincidence with one said harmonic frequency to another said harmonic frequency, comprising: a source of an offset frequency; a frequency divider having a dividing ratio related to the harmonic number of said predetermined harmonic to which phaselock is desired; control means to control the frequency of a third signal source having a frequency spectrum, capable of controlling the third signal source frequency to such a value that the difference in frequency between the second source frequency and the third source frequency is equal to the output frequency of said frequency

divider, said output frequency having a value equal to said offset frequency divided by the dividing ratio of said divider; mixing means for mixing the spectrum of the third spectrum signal source with a component of the signal of said first oscillator, to create as an output signal of said mixing means a beat frequency equal to the difference between the first oscillator frequency, coinciding with a harmonic of the second source spectrum, and a nearby harmonic of the third source spectrum; filter means to filter out said frequency, comparator-discriminator means connected to the filtered beat output signal and to the source of the offset frequency, integrating means to integrate the output signal of said comparator-discriminator to compare the relative position of both-said signals, periodic switching means to periodically feed an integrated output



signal of said comparator-discriminator into said frequency control system of said first oscillator and causing a break in the phaselock of the first oscillator frequency on a harmonic of the second source spectrum, when said beat frequency is higher than the offset frequency the discriminator output voltage being of such a magnitude and polarity as to decrease the frequency of the first oscillator, and when said beat frequency is lower than said offset frequency the output voltage of said comparator-discriminator is of such a magnitude and polarity as to increase the frequency of the first oscillator, and when said beat frequency is equal to said offset frequency the discriminator output retains a neutral condition in which it does not alter the voltage of the control system of the first oscillator, as long as the equality of both said frequencies is retained.

4,137,509

TUNABLE LASER BASED UPON S_2, Te_2 AND OTHER SELECTED DIMERS

Stephen R. Leone, Boulder, Colo., and Kenneth G. Kosnik, Burbank, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

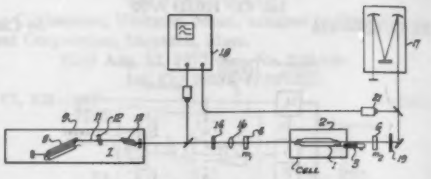
Filed May 2, 1977, Ser. No. 793,214
Int. Cl.[2] H01S *3/223*
U.S. Cl. 331—94.5 G **7 Claims**

1. A tunable laser based upon selected Group VI dimers comprising:

an optically resonant cavity,

a laser cell disposed in said cavity, said cell containing predominantly a vapor selected from a group of dimers consisting of S_2, Te_2, Se_2, TeO, TeSe, SO, TeS and SeS,

means for pumping said vapor from a ground state to a selected vibrational-rotational level in a selected excited electronic state below the known dissociation level of said excited state, said selected excited state being one having allowed transitions relative to said ground electronic state, whereupon a lasing output is produced at allowed transi-



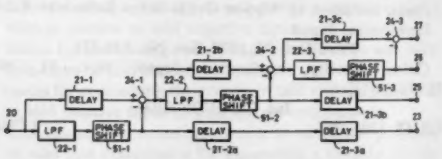
tions between said excited state level and the higher vibrational-rotational levels of said ground electronic state, and means for tuning said lasing output.

4,137,510

FREQUENCY BAND DIVIDING FILTER

Makoto Iwahara, Sagamihara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation-in-part of Ser. No. 760,956, Jan. 21, 1977, abandoned. This application Mar. 20, 1978, Ser. No. 888,561
Claims priority, application Japan, Jan. 22, 1976, 51-6108; May 24, 1977, 52-60089; May 24, 1977, 52-60091
Int. Cl.[2] H03H *7/46*
U.S. Cl. 333—6 **12 Claims**

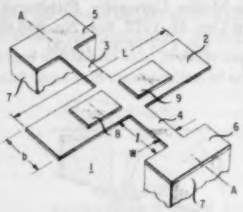


12. A frequency band dividing filter comprising: an input terminal for application thereto of input signals; a delay circuit connected to the input terminal; a low-pass filter connected in parallel with said delay circuit with respect to the input terminal and having a specific filtering frequency band with a steep cut-off characteristic; a subtraction circuit connected to the output sides of said low-pass filter and said delay circuit thereby to carry out subtraction of the outputs of said low-pass filter and said delay circuit; a phase-shifting circuit connected in a shunted signal path containing the low-pass filter between the input terminal and the subtraction circuit; a first output terminal for leading out the output low-frequency band signal of said low-pass filter; and a second output terminal for leading out the output high-frequency band signal of said subtraction circuit, the frequency phase characteristic of the cascade connection circuit of said low-pass filter and said phase-shifting circuit being equal to the frequency phase characteristic of delay circuit in the pass band of the low-pass filter.

4,137,511
ELECTROMECHANICAL FILTER AND RESONATOR

Joseph S. Jones, Macungie, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 13, 1977, Ser. No. 832,932
Int. Cl.[2] H03H 9/04, 9/24, 9/26
U.S. Cl. 333—71 8 Claims

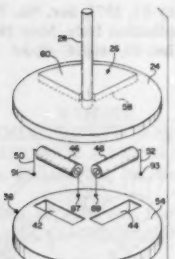


1. An electromechanical resonator in the form of a single planar body comprising:
an elongated torsionally vibratable member;
a flexurally vibratable resonating element coupled along its nodal axis to said member;
electromechanical transducer means attached to at least one side of said element for exciting mechanical vibrations in the resonator; and
means located at both ends of said member for attaching the resonator to a base, characterized in that the flexurally vibratable resonating element has a length, L, along a direction transverse to the torsionally vibratable member elongated direction, and a width, b, along said elongated direction such that the ratio L/b ranges between 3 and 4, thereby substantially eliminating unwanted flexural modes in the resonator.

4,137,512
CONTACTLESS MAGNETIC SWITCH

Edward F. Sidor, Lombard, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed May 13, 1977, Ser. No. 796,573
Int. Cl.[2] H01H 36/00
U.S. Cl. 335—206 17 Claims

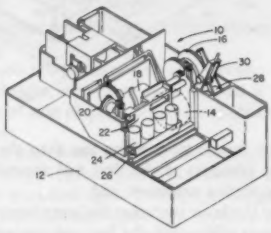


1. An electrical contactless switching device for achieving a rapid change in output signal constituting a switching action comprising first and second elongated, contactless sensing elements constructed to be electrically interconnectable, each of said sensing elements having a substantially straight longitudinal axis and being shaped to form a rectangular projection in a plane and being of the type that undergo a continuous change of condition between a first state and a second state in accordance with the area of said projection that is influenced by a local magnetic field, at least one permanent magnet positioned adjacent said sensing elements, to provide said local magnetic field, said permanent magnet being shaped to have first and second substantially straight edges, each of which passes adjacent to one of said rectangular projections so that when one of said edges is aligned along the entire longitudinal axis of one of said sensing elements the other of said edges will be aligned along the entire longitudinal axis of the other of said sensing elements.

4,137,513
MATRIX PRINT WIRE SOLENOID

John W. Reece, Sunnyvale, Calif.; Victor J. Italiano, Ithaca, and Leslie L. Crump, Trumansburg, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Oct. 27, 1977, Ser. No. 846,082
Int. Cl.[2] H01F 7/16
U.S. Cl. 335—219 15 Claims



1. A solenoid for moving a print wire, comprising a housing, a
first pole piece enclosing one end of said housing and having an aperture therethrough, a
second pole piece enclosing the other end of said housing and having an aperture therethrough, an
armature positioned in the aperture of said second pole piece, said print wire being secured to said armature and movable therewith upon movement of said armature, a
coil for providing magnetic flux in a path through said housing and said pole pieces to cause axial movement of said armature and said print wire, a
sleeve encircling a portion of said armature and a portion of said first pole piece for containing said coil, said sleeve having an enlarged diametral portion engaged by said first pole piece for positioning said first pole piece in axial relation with said armature and providing a gap therebetween, and
means connecting said first pole piece and said armature for maintaining said armature in fixed position prior to energization of said coil, for permitting said armature to move along said gap upon energization of said coil, and for returning said armature to said fixed position upon deenergization of said coil.

4,137,514
CONTROL MECHANISM

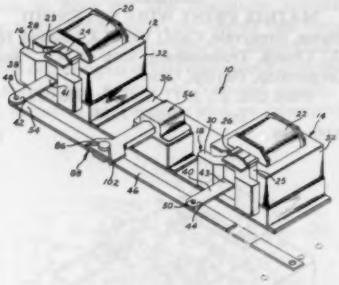
Lonnie C. Wright, and David L. Billings, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Oct. 11, 1977, Ser. No. 841,164
Int. Cl.[2] H01F 7/08
U.S. Cl. 335—220 9 Claims

1. A control mechanism for providing four separate linear control positions comprising:
a lever having two ends, one end being free to register the four linear positions,
first and second stationary solenoids both being located on one side of the lever and each including a plunger within an electrically energized coil that produces a magnetic field, the plunger being movable responsive to actuation of the solenoid, said first solenoid plunger being pivotably secured to the lever at the end thereof opposite the free

end and the plunger of the second solenoid being pivotably secured to the lever between the ends thereof, and

a stationary assembly including a spring positioned and arranged to exert force on the lever between the first and second solenoid in a direction opposite the direction of plunger movement upon solenoid actuation, said spring



force exerted on the lever being less than the combined force of the plungers of the first and second solenoids upon their common actuation, and

means to move the lever such that the lever is perpendicular to the plungers when both the first and second solenoids are deactuated.

4,137,515

SYNTHETIC RESIN PACKED COIL ASSEMBLY

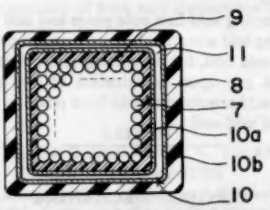
Masatake Akao, Katano; Yoshikazu Yokose, Takarazuka; Kazuo Yamashita, and Takashi Shibano, both of Kawanishi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 615,082, Sep. 19, 1975, abandoned. This application Nov. 14, 1977, Ser. No. 851,588

Claims priority, application Japan, Sep. 19, 1974, 49-108528; Sep. 19, 1974, 49-108529; Sep. 19, 1974, 49-108530; Sep. 19, 1974, 49-108531; Sep. 19, 1974, 49-108532; Sep. 19, 1974, 49-108533; Sep. 20, 1974, 49-109098; Jan. 14, 1975, 50-6565; Apr. 17, 1975, 50-47030

Int. Cl.[2] H01F *15/04, 27/30*

U.S. Cl. 336—84 C **9 Claims**



1. A synthetic resin packed coil assembly which comprises

a wound spiral of a plurality of bundled turns of insulated wire,

a first layer of high strength fibrous material impregnated with a synthetic resin, said first layer forming the outer periphery of said synthetic resin packed coil assembly,

an intermediate insulating layer disposed between said wound spiral and said first layer, and

a semi-conductive layer disposed between said intermediate insulating layer and said first layer, said semi-conductive layer being constituted by a first ply firmly bonded to said intermediate insulating layer and a second ply firmly bonded to said first layer, there being a layer of a release agent and an air-gap layer disposed between said first and second plies.

4,137,516

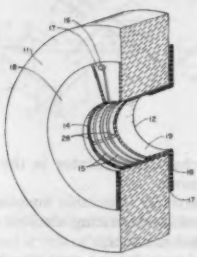
GRINDING WHEEL CRACK DETECTOR

Milton C. Shaw; Rangachary Komanduri, both of Pittsburgh, Pa., and Soichi Kumekawa, Higashimurayama, Japan, assignors to Carnegie-Mellon University, Pittsburgh, Pa.

Filed Oct. 31, 1977, Ser. No. 846,688

Int. Cl.[2] H01C *13/00*

U.S. Cl. 338—67 **20 Claims**



1. The combination of a grinding wheel and crack detecting means therefore, those means comprising a film of electrically insulating material affixed to the surface of the bore in the grinding wheel, a coil of an electrical conductor disposed on the film so as to form a plurality of turns around the grinding wheel bore, and contact means for each end of the coil affixed to the grinding wheel and adapted for connection with external continuity determining means, the film and the conductor being weak in tension relative to the grinding wheel, so that inception of a crack in the grinding wheel ruptures the conductor.

4,137,517

POTENTIOMETRIC REGULATOR OF A PHYSICAL MAGNITUDE WHICH IS A FUNCTION WHATEVER OF OTHER TWO MAGNITUDES

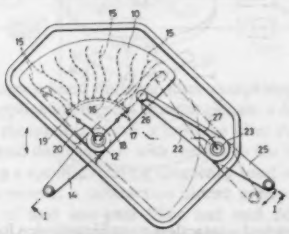
Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed May 17, 1977, Ser. No. 797,874

Claims priority, application Italy, May 19, 1976, 23414 A/76

Int. Cl.[2] H01C *10/30*

U.S. Cl. 338—118 **3 Claims**



1. A potentiometric regulator for providing a desired voltage output based upon two independent internal combustion engine parameters, said regulator comprising:

a poor and constant conductive surface having first and second directions;

a plurality of conductors extending along said surface generally in said first direction;

voltage means for supplying a preselected voltage to each of said conductors;

pin means for establishing electrical contact with a portion of said plurality of conductors on said surface directly or through said surface;

first means, responsive to one of said engine parameters, for providing relative movement between said surface and said pin means in said first direction;

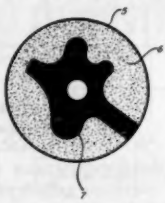
second means, responsive to the other of said engine parameters, for providing relative movement between said surface and said pin means in said second direction; and each of said plurality of conductors arranged along traced curves on said surface so as to provide said desired voltage output based upon said combination of engine parameters.

4,137,518

RESISTANCE DISK

George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md. 20034

Filed Sep. 6, 1977, Ser. No. 826,899
Int. Cl.[2] H01C *10/26*
U.S. Cl. 338—150 3 Claims



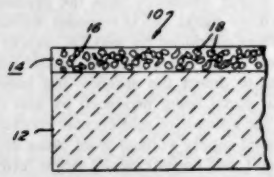
1. A variable resistor assembly including in combination, a nonconductive plate having thereon a randomly configured radially varying resistance surface and rotatable about a transverse axis, at least two spaced substantially fixed contact members electrically engaging the resistance surface of said plate and so disposed with respect to each other that substantially only the radial resistance of the resistance surface upon the disk is applied between the contacts whereby the resistance pattern between said contacts is caused to continually vary in a gradual and random-like manner by rotation of the disk between said contacts.

4,137,519

RESISTOR MATERIAL, RESISTOR MADE THEREFROM AND METHOD OF MAKING THE SAME

Malcolm H. Hodge, Philadelphia, Pa., assignor to TRW, Inc., Cleveland, Ohio

Filed Oct. 25, 1977, Ser. No. 844,793
Int. Cl.[2] H01C *1/012*
U.S. Cl. 338—308 20 Claims



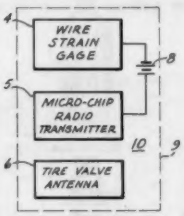
1. A resistor material comprising a mixture of particles of tungsten carbide, tungsten trioxide, and a glass frit.

4,137,520

TIRE PRESSURE INDICATOR SYSTEM

Levi J. Deveau, 2631 NW.-9-Terr., Wilton Manors, Tenn.

Filed May 12, 1978, Ser. No. 905,205
Int. Cl.[2] B60C *23/04*
U.S. Cl. 340—58 2 Claims



1. A vehicular tire pressure indicator system, in combination comprising:

at least one tire pressure indicator having

a diaphragm wire strain gage adapted to signal on departure of said diaphragm from a specified pressure range value,

a signal transmitter disposed on a microchip, said transmitter adaptively coupled to receive an unbalanced pressure electrical signal from said strain gage, and to transmit said pressure signal to a tire stem metal antenna,

a battery power source electrically powering said indicator,

a flexible bellows hermetically enclosing said strain gage, signal transmitter, and said power source, said flexible bellows having an inert gas atmosphere disposed therein at a specific pressure value,

a metal valve stem for a tire, having an electrical insulation exterior, providing a signal transmitter antenna,

a mounting clamp means having an electrical conductive coupling between said transmitter and said antenna, said clamp securing said flexible bellows in the interior of said tire disposed on said tire stem,

at least one signal receiver having signal indicating means secured thereon, providing information that said tire pressure indicator signals a tire pressure value exceeding a predetermined value.

4,137,521

ANTENNA ALARM

Roberto Martinez, 2408 Whitewing, McAllen, Tex. 78501

Filed Feb. 9, 1977, Ser. No. 766,886
Int. Cl.[2] G08B *13/14;* B60R *25/10*
U.S. Cl. 340—63 2 Claims

1. An antenna and support assembly, comprising;

(a) an antenna; said antenna including a loading coil;

(b) a screw-threaded base member adapted to receive said loading coil;

(c) a screw-threaded stud member in combination with a base plate, said stud member being adapted to receive said base member;

(d) a push-button switch mounted in combination with said base plate, the button thereof being located in an upright position at a distance from said stud sufficient to clear the lower edge of said base member when the latter is screwed in place, but at least partly within the radius of the bottom of the loading coil, whereby said button is depressed by

the bottom of the loading coil when the latter is screwed in place; and

(e) a remote alarm signal generating means electrically coupled to said switch, whereby removal of said antenna turns on the alarm signal.

4,137,522

REMOTE CONTROL APPARATUS FOR A PLURALITY OF CONTROLLABLE OBJECTS

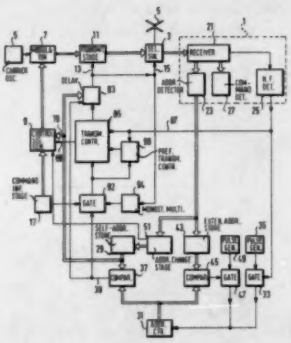
Hermann Stein, Munich, Germany, assignor to Steuerungstechnik GmbH, Munich, Germany

Filed Aug. 31, 1977, Ser. No. 829,311

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1976, 2639363

Int. Cl.[2] H04Q *9/00*

U.S. Cl. 340—147 R **28 Claims**



1. Apparatus for furnishing control signals in a predetermined sequence to a plurality of controllable objects, said apparatus comprising a plurality of individual control units, each for furnishing a control signal to a corresponding one of said objects, each control signal comprising a self-address signal signifying the position in said predetermined sequence of said control signal and a command portion specifying the operation to be carried out by the controlled object, each of said individual control units comprising, in combination, first storage means for storing said self-address signal thereby furnishing a stored self-address signal; receiving means for receiving control signals transmitted by the others of said individual control units, furnishing a blocking signal indicative of the presence of a received control signal, and detecting the address in said control signal and furnishing a corresponding external address signal; second storage means connected to said receiving means for storing said external address signal, thereby furnishing a stored external address signal; timing means connected to said receiving means for furnishing a sequence of timing signals starting at a predetermined time instant following termination of reception of said control signal; enable means connected to said first and second storage means and said timing means for receiving said timing signals, and furnishing said transmit enable signal when the number of received timing signals corresponds to the difference between said stored external address signal and said stored self-address signal; and blocking means for blocking the furnishing of said transmit enable signal in response to said blocking signal, whereby transmission from all except the first enabled one of said individual control units following termination of reception of the previous control signal is blocked.

4,137,523

DIGITAL DISPLAY DRIVING CIRCUIT

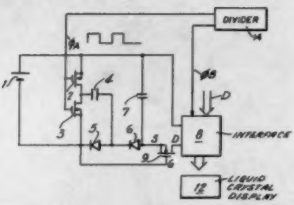
Fumiaki Mukaiyama, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 19, 1976, Ser. No. 687,584

Claims priority, application Japan, May 20, 1975, 50-60575

Int. Cl.[2] 361 *58; G02F 1/13*

U.S. Cl. 340—813 **6 Claims**



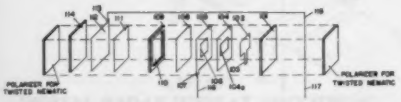
1. In a digital display driving circuit for driving digital display cells forming a digital display, said driving circuit having interfacing circuit means adapted to be energized, and in response thereto receive a first data signal for selectively energizing certain of said display cells and a second driving signal produced by a signal source means and having a predetermined frequency for effecting an AC drive of said display cells selected by said data signals, the improvement comprising DC supply means for producing a voltage adapted to energize said interfacing circuit means, switching transistor detecting means coupled intermediate said DC supply means and said interfacing circuit means, said detecting means being adapted to detect when said drive signal is applied to said interfacing circuit means, and in response thereto apply said energizing voltage produced by said DC supply means to said interfacing circuit means, said detecting means being further adapted to detect when said drive signal is not being produced by said signal source means, and in response thereto, prevent said interfacing circuit means from being energized by said energizing voltage produced by said DC supply means, and booster circuit means intermediate said DC supply means and said detecting circuit means, said booster circuit means being adapted to receive a booster control signal produced by said signal source means and having a higher frequency than the predetermined frequency of said drive signal, and in response thereto elevate the energizing voltage produced by said DC supply means, said detection circuit means being coupled to said booster circuit means in order to detect the absence and presence of said booster control signal being produced by said signal source means, and in the absence of said booster control signal, prevent said elevated supply voltage from being applied to said interfacing circuit, said booster circuit means further including first and second transistor means adapted to receive said booster control signal, said first and second switching transistor means being alternately turned ON and OFF in response to said booster control signal being applied thereto, and first

charging means coupled in parallel with said second transistor means, and second charging means coupled in parallel with said first transistor means and the parallel connection of said second transistor means and first charging means, said second charging means defining the output of said booster circuit means for applying said elevated supply voltage to said detecting circuit means, said first charging means being charged by said DC supply means in response to said first transistor means being turned ON, said second charging means being charged by said DC cell and said first charging means, in response to said second transistor means, being turned ON.

4,137,524
REVERSIBLE PRINTING DISPLAY

Schoen-nan Chen, North Brunswick, and Kenneth J. Harrison, Plainsboro, both of N.J., assignors to Optel Corporation, Princeton, N.J.

Filed Sep. 28, 1977, Ser. No. 837,070
Int. Cl.[2] G02F *1/13*
U.S. Cl. 340—765 **7 Claims**



1. A display comprising:
- a display electrode having the shape of a symbol to be displayed;
- a layer of display material positioned in spaced aligned relationship to the display electrode;
- a background electrode positioned in interposing aligned relationship between the display electrode and a first side of the display material layer, the background electrode having an aperture therein which has the shape of the symbol to be displayed, the size of the aperture being the same or less than the display electrode;
- a counterelectrode positioned in alignment with the aforementioned components and facing a second side of the display material layer; and
- electrical means respectively connected to the electrodes and the counterelectrode for selectively enabling normal and reversed printed images of the symbol in the display material layer.

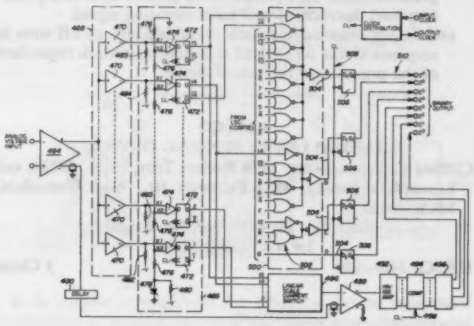
4,137,525
SIGNAL CONVERTER

Sylvan F. Tyrrel, 443 Beverly Dr., Richardson, Tex. 75080

Division of Ser. No. 565,869, Apr. 7, 1975, Pat. No. 4,016,555.
This application Jan. 5, 1976, Ser. No. 646,565
Int. Cl.[2] H03K *13/175*
U.S. Cl. 340—347 AD **6 Claims**

1. An analog-to-digital converter, comprising in combination:
- a first linear isolation amplifier having an analog input signal applied thereto;
- a first linear scale comparator connected to the output of said first isolation amplifier and generating a binary coded linear scale output varying with the analog input signal, said linear scale comparator including:
  - a plurality of flip-flops,
  - a voltage ladder network generating voltages at different levels in number equal to said flip-flops, and
  - a plurality of amplifier means in number equal to the number of said flip-flops, said amplifier means having individual outputs connected to one of said flip-flops and one input responsive to a voltage of said ladder and a second input responsive to the analog input signal from said first isolation amplifier;

means responsive to the output of said first comparator and a time delayed value of the analog input signal for generating a difference analog voltage;
- a second linear isolation amplifier having the difference analog voltage applied to an input;
- a second linear scale comparator connected to the output of said second isolation amplifier and generating a binary coded linear scale output varying with the difference voltage;

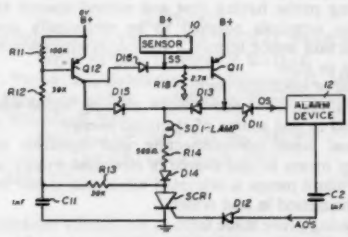


- a first linear scale to binary translator responsive to the output of said first comparator and generating the most significant bits of a binary coded output; and
- a second linear scale to binary translator responsive to the output of said second comparator and generating the least significant bits of a binary coded output.

4,137,526
ALARM ZONE DISABLING CONTROL CIRCUIT

Floyd S. Merchant, Box P25, R.D. Asbury, N.J. 08802

Filed Mar. 29, 1977, Ser. No. 782,443
Int. Cl.[2] G08B *29/00, 25/00*
U.S. Cl. 340—506 **15 Claims**



1. A control circuit for an alarm system, the system having a sensor to provide a sensor signal, an alarm device responsive to an operating signal to provide an alarm output signal and to signal an alarm, the control device comprising:
- a normally off sensor responsive switch having an on state and an off state,
- a normally off holding switch having an on state and an off state,
- a normally off latching switch having an on state and an off state,
- said sensor responsive switch switching into its on state in response to said sensor signal when said holding switch is in its off state to provide an operating signal,
- means responsive to said alarm output signal to provide a latch initiating signal to said latching switch, said latching initiating signal having a predetermined duration,
- said latching switch switching into its on state in response to said latch initiating signal when said sensor responsive switch is in its on state,

said latching switch holding its on state in response to said on state of said sensor responsive switch and/or said on state of said holding switch,

said holding switch switching into its on state in response to the on state of said latching switch, and

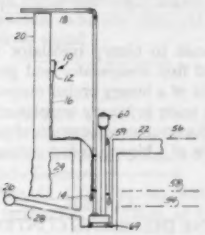
delay means coupled to said holding switch and responsive to the switching on of said latching switch to delay said on state of said holding switch a predetermined time period after said latching switch switches into its on state, said predetermined time period being greater than said predetermined duration of said latch initiating signal,

said sensor responsive switch switching into its off state in response to the on state of said holding switch regardless of the presence of the sensor signal.

4,137,527
LIQUID LEVEL SENSING DEVICE

Clifford C. Tennenhouse, 1876 Boulan, Troy, Mich. 48084, and Leonard Olshansky, 4833 Faircourt Dr., West Bloomfield, Mich. 48033

Filed Jul. 18, 1977, Ser. No. 816,333
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—620 **1 Claim**



1. A liquid level sensing device adapted to be inserted in a basement sump or drain pipe for detecting the level of water below the basement level of a building, said water level sensing device comprising:

a sensing probe having first and second spaced electrical sensor terminals adapted to be electrically connected when said sensor terminals are immersed in water in said sump or pipe;

a source of electrical energy;

an alarm means for providing a warning signal when connected to said source of electrical energy;

electrical wires interconnecting said terminals and said alarm means to said source of electrical energy whereby said alarm means is activated when said sensor terminals are immersed in said water;

said sensing probe made from an electrically insulating material and having an element with an upper and lower section connected by an intermediate smaller section so as to define a pair of walls on said smaller section inwardly spaced from the outer edges of said upper and lower walls; said electrical sensor terminals being carried on opposite outer walls of said smaller section such that the path of electrical communication between said electrical sensor terminals is around said upper and lower surfaces; a portion of said wire connected to said sensor terminals being embedded in said smaller section, said pair of walls on said smaller section being inwardly spaced from the outer edges of said upper and lower walls a distance sufficient to prevent said sensor terminals attached thereto from contacting the wall of said sump or pipe wherein said probe has been positioned when the upper or lower walls of said probe contact a wall of said sump or pipe;

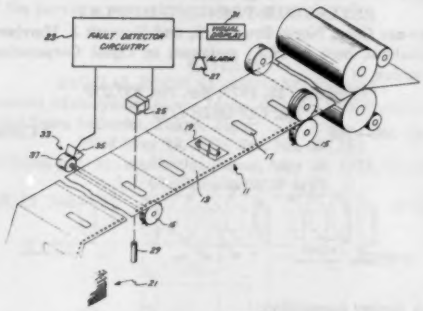
a housing mounting said alarm means, said housing being mounted at a position remote from said water and connected to said sensing probe by means of said electrical wires; and

a switching deviced wired such that the alarm means remains on after the water recedes below the level of the sensing probe until it is reset, whereby the system will deliver a warning of impendent flood.

4,137,528
FAULTY WINDOW CONSTRUCTION DETECTING APPARATUS

John E. Traise, Niagara Falls, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Aug. 25, 1977, Ser. No. 827,479
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—675 **12 Claims**



1. In a high speed press comprising a die-cut system for successively cutting window openings in a plurality of window areas of a moving web and comprising a window patch securement system for securing a window patch over each window opening, fault detector circuitry for signaling the presence of light-blocking material covering a window area and for signaling the absence of a window patch which leaves an opening in a window area, comprising:

phototransducer means positioned to sense the transparency of the web along the line of window travel for transducing a sensed opening in a window area to a first output level, transducing sensed light-blocking material to a second output level and transducing a sensed window patch overlaying a window opening to a third output level;

referencing means for producing a predetermined output level at the time a window area is in a position to be sensed by said phototransducer means;

processing circuitry means receiving the output of said referencing means and the output of said phototransducer means for producing a fault signal indicative of the sensing of light-blocking material in a window area or a window opening; and

operator indicator means responsive to said fault signal for providing an operator indication of the occurrence of a fault.

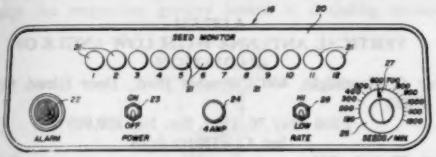
4,137,529
CALIBRATED TUNEABLE MONITOR

James H. Anson, Auburn, and David E. Steffen, Chatham, both of Ill., assignors to Dickey-john Corporation, Auburn, Ill.

Filed Aug. 14, 1974, Ser. No. 497,222
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—684 **8 Claims**

1. A monitor system for connection to multi-row seed planting apparatus for indicating that the rate of seeds being planted is at least equal to a predetermined rate comprising: a monitor panel, a plurality of seed sensors, each associated with one row of said multi-row seed planting appratus, first circuit means arranged for connection to each of said plurality of seed sensors to receive pulse signals for seeds being planted, indicator means on said monitor panel, and adjustable calibrated means including indicia on said panel to select and indicate said prede-

termined rate, said adjustable calibrated means being connected to second circuit means coupled to said first circuit



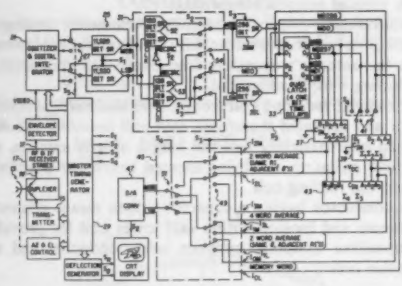
means for actuating said indicator means in response to sensing a seed planting rate which is below said predetermined rate selected and indicated by said adjustable calibrated means.

4,137,530

DIGITAL RADAR DISPLAY SMOOTHING

Marvin L. Hooker, Jr., Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 27, 1977, Ser. No. 809,954
Int. Cl.[2] G01S 7/10
U.S. Cl. 343—5 VQ **5 Claims**



3. In a radar system of the type including means for receiving echo signals from targets in a searched space; means for producing, from the received echo signals, an array of digital words representative of the searched space; and digital memory means for storing for a predetermined time at least words W_a, W_b, W_c, and W_d of said array of digital words, said words W_a, W_b, W_c, and W_d corresponding to four segments of the searched space, the W_c corresponding segment being at the same range as the W_a corresponding segment, the W_d corresponding segment being at the same range as the W_b corresponding segment, and the W_b corresponding segment being at a range different from the W_a corresponding segment, the improvement comprising:

means for producing a digital word W_{abcd} whose value lies between the smallest and largest values of the words W_a, W_b, W_c, and W_d, and

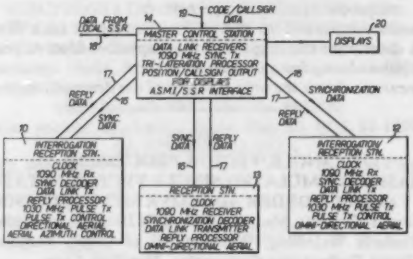
means, including display means, for producing display images corresponding to said words W_a, W_b, W_c, W_d, and W_{abcd}, and for controlling the location on said display means of the display images corresponding to said words such that the image corresponding to the word W_{abcd} is displayed substantially centrally of the images corresponding to the words W_a, W_b, W_c, and W_d.

4,137,531

RADAR SELECTIVE INTERROGATION SYSTEM

Christopher Pell, Horndean, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed May 12, 1977, Ser. No. 796,336
Claims priority, application United Kingdom, May 13, 1976, 19697/76; Jul. 8, 1976, 28413/76
Int. Cl.[2] G01S 9/56
U.S. Cl. 343—6.5 R **11 Claims**



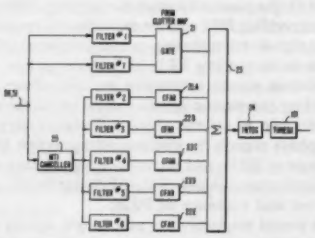
1. In a radar arrangement for effecting ground movement monitoring of vehicles carrying secondary surveillance radar transponders operative to provide a desired reply when interrogated by a pair of pulses having a first predetermined time separation and an interfering reply when spuriously interrogated by a pair of pulses having a second predetermined time separation, means for overcoming garbling of a desired reply by an interfering reply from a spuriously interrogated transponder comprising aerial means for transmitting a first pair of pulses timed to reach any spuriously interrogated transponder with said second predetermined time separation, and for transmitting a second pair of pulses timed to reach any transponder from which a desired reply is required with said first predetermined time separation so as to initiate interrogation thereof before any spuriously interrogated transponder becomes responsive to further interrogations.

4,137,532

VIP DOPPLER FILTER BANK SIGNAL PROCESSOR FOR PULSE DOPPLER RADAR

John W. Taylor, Jr., Baltimore, and Raymond G. Martin, Ellicott City, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 29, 1977, Ser. No. 792,279
Int. Cl.[2] G01S 9/42, 7/30
U.S. Cl. 343—7.7 **10 Claims**



1. In a pulse doppler radar system, the combination comprising:

means for generating radar pulses at predetermined variable interpulse periods;

means for receiving the echo pulses;

means for converting the sampled pulses to digital words;

a plurality of digital filters, each filter having I and Q components;

said plurality of digital filters being operative to receive the digital words in sequence at the sample times, each of said filters being constituted to provide attenuation to pulse echoes from objects less than a predetermined velocity over a different predetermined doppler frequency band, each said filter having a single rejection notch, the width of which is a large fraction of the reciprocal of the average period between the sampled pulses, each said filters being constituted also to provide substantially no attenuation to pulse echoes having doppler frequencies greater than the reciprocal of said average period;

means responsive to clutter interference in each filter to desensitize the outputs of the respective filter to prevent false alarms from clutter; and

means to detect the output values of the desensitizing means.

4,137,533

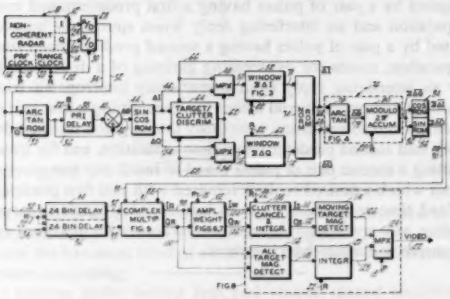
ANGLE/VECTOR PROCESSED, PHASE-ACCUMULATED SINGLE VECTOR ROTATION, VARIABLE ORDER ADAPTIVE MTI PROCESSOR

George T. Briechle, Monroe; John A. Di Domizio, Norwalk, and Frederik Weindling, Westport, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 12, 1977, Ser. No. 841,279

Int. Cl.² G01S 9/42

U.S. Cl. 343—7.7 **8 Claims**



1. Adaptive moving target indicator radar signal processing apparatus for use with coherent or non-coherent radar of the type which provides return signals indicative of reflections received in each of a plurality of successive range bins as a consequence of repetitive illumination of a target area in each of a sequence of pulse repetition intervals (PRIs), comprising:

difference means responsive to said return signals for comparing the phase of signals in each range bin during each PRI with the phase of signals in a corresponding range bin of a succeeding PRI and for providing in response thereto phase signals representing estimated phase difference of clutter in succeeding PRIs of each range bin;

accumulation means responsive to said phase signals for providing summation signals indicative of the summation, modulo two pi, of the phase differences represented by said phase signals in corresponding range bins of said sequence of PRIs, said summation signals representing the estimated accumulated phase of clutter in the given range bin over said sequence of PRIs;

rotation means responsive to said return signals and to said summation signals to provide, in each range bin, rotated vector signals indicative of a vector of amplitude and angle represented by said return signals in said range bin rotated through the angle represented by said summation signals for said range bin; and

clutter elimination means responsive to said rotation means for combining said rotated vector signals related to a like range bin in several PRIs to provide moving target signals indicative of the presence of moving targets having average doppler frequency significantly different from the estimated clutter doppler frequency related to said phase signals.

4,137,534

VERTICAL ANTENNA WITH LOW ANGLE OF RADIATION

Roy G. Goodnight, 440 Columbia Blvd., Deer Island, Oreg. 97051

Filed May 26, 1977, Ser. No. 800,969

Int. Cl.² H01Q 9/16

U.S. Cl. 343—752 **4 Claims**

1. A vertical antenna comprising:

a substantially vertical continuous conductor having an effective length of substantially an electrical quarterwave at the antenna's operating frequency, said conductor including a top loading coil,

and a lower, radiating coil wound over said vertical conductor and insulated therefrom, said coil covering not more than approximately half the length of said antenna, said lower radiating coil being located below the position of said top loading coil

said conductor having a capacitive plate means connected thereto and located within said lower coil for providing capacitive coupling between said conductor and said lower coil.

4,137,535

TELESCOPING ANTENNA MAST

Walter Rupprecht, Am Storksberg 8, Linsengericht 1, Fed. Rep. of Germany (6464)

Filed Sep. 9, 1977, Ser. No. 831,987

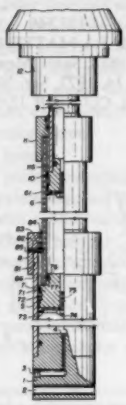
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1976, 7629017

Int. Cl.² H01Q 1/04

U.S. Cl. 343—902 **12 Claims**

1. A telescoping antenna mast comprising a plurality of hollow tubular members dimensioned so that progressively higher located tubular members fit into the next adjacent lower tubular member, each tubular member, except the lowest tubular member, having a lower end comprising piston means slidingly fitted into the next adjacent lower member, each piston means having gas passage means therethrough interconnecting the spaces in the hollow tubular members in succession, said lowest tubular member having gas port means connectable to a source of pneumatic pressure and openable, whereby the tubular members are extendible by pneumatic pressure admitted into said lowest tubular member, said tubular members comprising cylindrical walls, a longitudinal groove in each cylindrical wall except in the wall of the lowermost tubular member, each tubular member, except the upper-

most tubular member, further comprising around its upper end bushing means slidingly receiving the next higher tubular member, and cam means in said bushing means positioned to engage the respective groove means in a sliding manner



whereby the longitudinal telescoping movement of said tubular members is guided by said cam means and any rotational movement of one tubular member relative to any other tubular member is prevented.

4,137,536

ELECTROSTATIC PRINTING DEVICE WITH AIR CUSHION GUIDING

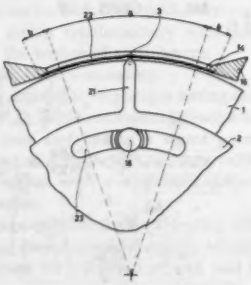
Hans-Dieter Hinz, Tornesch, and Ulf Rothgordt, Norderstedt, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 22, 1977, Ser. No. 808,802

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634561

Int. Cl.[2] G03G *15/00*; G01D *15/28*

U.S. Cl. 346—155 **6 Claims**



1. A device for the electrostatic printing of alphanumerical characters or facsimile images on an associated elongated record carrier which comprises: a rotatable printing roller which includes one or more radially extending stylus electrodes disposed at equal angular increments about said roller, means for holding the record carrier in spaced relationship from said printing roller, an air cushion without physical support touching the record carrier disposed in the region of said record carrier which is touched by said stylus electrodes, means for moving said record carrier axially and continuously during printing, means for selectively applying controllable electric pulses to each stylus electrodes when there is contact with the record carrier, so that discrete point images are recorded, means for rotating said printing roller in a plane transverse to the axial direction of the record carrier, said means for holding said record carrier positioning including a guide element cooperating with the record carrier in front of and behind the region in which contact between each said stylus electrode and the record carrier occurs, said guide leaving this region at least partly unconstrained in order to form an arcuate surface which is coaxial to the axis of the printing roller.

4,137,537

ELECTROSTATIC TRANSFER PROCESS AND APPARATUS FOR CARRYING OUT THE SAME

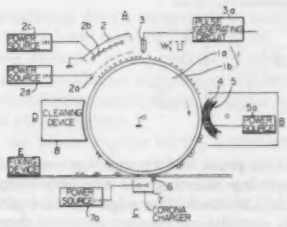
Hideo Takahashi, Yokohama; Kazuhisa Aikawa, Zushi, and Masakatsu Horie, Atsugi, all of Japan, assignors to Fujitsu Limited, Japan

Filed Dec. 12, 1977, Ser. No. 859,870

Claims priority, application Japan, Dec. 13, 1976, 51-149982

Int. Cl.[2] G03G *15/052*

U.S. Cl. 346—159 **16 Claims**



1. An electrostatic transfer process for performing an electrostatic printing of an image onto a recording paper comprising the steps of:

applying a uniform level of electrostatic charges of a predetermined polarity onto an insulating layer surface of an electrostatic latent image forming material comprised of a conductive substrate and an insulating layer on the conductive substrate;

causing a reduction in the level of electrostatic charges applied to image forming areas of the insulating layer surface wherein an electrostatic latent image corresponding to said image to be printed is formed;

passing said electrostatic latent image forming material past a developing electrode means to which an electric voltage having the same polarity as that of said electrostatic charges applied onto said insulating layer surface of said electrostatic latent image forming material is impressed;

supplying said insulating layer surface of said electrostatic latent image forming material with a developer carrying thereon electrostatic charges of the same polarity as that of said electric voltage impressed to said developing electrode means while said electrostatic latent image forming material is passing by said developing electrode means, thereby allowing said developer to adhere to said image forming areas of said insulating layer surface wherein the level of electrostatic charges is reduced, so that said electrostatic latent image is visualized by said developer, and;

transferring said visualized electrostatic latent image of said electrostatic latent image forming material onto said recording paper.

4,137,538

PROCESS AND APPARATUS FOR COMPATIBLE WET AND DRY PAPER SIGNAL RECORDING

Martin Klein, Salem, N.H., assignor to Klein Associates, Inc., Salem, N.H.

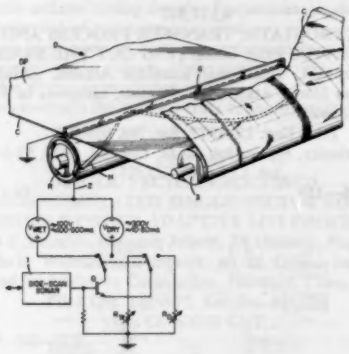
Filed Aug. 11, 1977, Ser. No. 823,608

Int. Cl.[2] G03G *17/02*

U.S. Cl. 346—165 **12 Claims**

1. A process for enabling dry electric-signal recording paper

having a chemically coated display surface normally susceptible to electric-discharge marking as a wire spring-pressured relatively high voltage, low-current-carrying stylus point engages the same to be interchanged with wet paper having chemical treatment for producing a chemical darkening reaction in the presence of moisture and relatively high electrical signal current at relatively low voltage, normally passed across the same between a moving helical conductive edge, rather



than a stylus wire point, and a grounding conductive edge, the process comprising inserting the said dry recording paper between the helical conductive edge and said grounding conductive edge; establishing contact pressure therebetween in excess of the range of pressures normally used for wire spring-pressured stylii; and drawing the electric-discharge to the edge adjacent said coated display surface of said dry recording paper while rotating the signal-provided helical edge against the paper.

4,137,539

SINGLE LENS REFLEX CAMERA

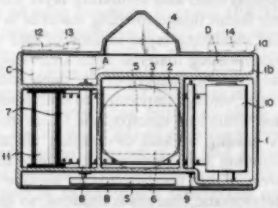
Yoshihisa Maitani, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Japan

Continuation of Ser. No. 329,110, Feb. 2, 1973, abandoned. This application Sep. 23, 1976, Ser. No. 726,029

Claims priority, application Japan, May 22, 1972, 47-50582; May 22, 1972, 47-50583

Int. Cl.[2] G03B *9/34, 9/62, 19/12*

U.S. Cl. 354—152 **20 Claims**



2. In a single lens reflex camera comprising a camera body having a top, bottom, front, back and two sides, an object lens on the front of the camera body, first and second shutter blinds positioned in the camera body between the object lens and the back of said camera body, high and low speed shutter controlling mechanisms received in the camera body; actuating means for said high and low speed shutter controlling mechanisms; a reflex mirror located between the object lens and the shutter blinds, a shutter blind winding shaft positioned between the reflex mirror and one side of the camera body, a shutter blind rewinding shaft positioned between the reflex mirror and the other side of the camera body; the improvement comprising at least a portion of said high speed shutter controlling mechanism being located between the bottom of the camera body and the lower edge of the reflex mirror and controlling the movement of the second shutter blind during travel of the first shutter blind.

4,137,540

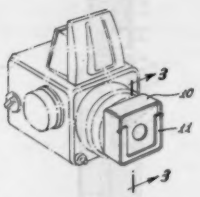
CAMERA MATTE BOX

Jack Curtis, P.O. Box 1853, Santa Monica, Calif. 90406

Filed Oct. 14, 1977, Ser. No. 842,287

Int. Cl.[2] G03B *11/00*

U.S. Cl. 354—296 **10 Claims**



1. A camera matte box comprising in combination:

a shell having at one end mounting means for mounting said shell on a camera and at the opposite end, guide means for slidingly receiving a tray; and

a tray for sliding insertion into said shell, said tray including means for supporting a mask therein.

4,137,541

AUTOMATIC EXPOSURE CONTROL APPARATUS FOR A SINGLE LENS REFLEX CAMERA

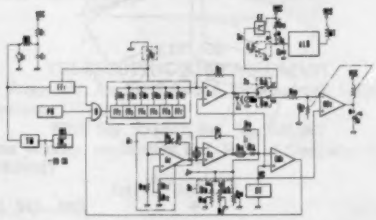
Yukio Mashimo, Tokyo; Masanori Uchidoi, Yokohama; Masayoshi Yamamichi, Kawasaki; Fumio Ito, Yokohama; Tokuichi Tsunekawa, Yokohama, and Tadashi Ito, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 3, 1975, Ser. No. 619,456

Claims priority, application Japan, Oct. 7, 1974, 49/115305; Dec. 23, 1974, 49/147842

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—23 D **13 Claims**



1. An automatic exposure control apparatus for a single lens reflex camera comprising:

(a) manually adjustable shutter time setting means having a signal generator arranged upon setting of a shutter time to produce an electrical signal with a magnitude proportional to said shutter time;

(b) an objective lens of said camera;

(c) diaphragm means having a range of sizes of the aperture for said objective lens;

(d) light value sensing means having a photosensitive element arranged upon receiving scene light entering through said objective lens with the full-size aperture of said diaphragm means to produce an electrical signal with

a magnitude proportional to the intensity of said scene light;

(e) automatically adjustable setting means for said diaphragm means adapted to select an aperture value as the function of said shutter time and said scene light intensity;

(f) adjusting means for said automatically adjustable setting means having a signal generator arranged upon operative association of said adjusting means with said setting means to produce an electrical signal with a magnitude proportional to the aperture value selected as the function of the position of said setting means;

(g) pulse generating means;

(h) digital-to-analog pulse generating means upon counting of the number of pulses supplied therefrom to produce an electrical signal with a time variable magnitude proportional to said number of pulses;

(i) first comparing means receptive of the electrical signals from said light value sensing means and said digital-to-analog converting means and responsive to the establishment of a predetermined relationship between the magnitudes of said electrical signals for producing an electrical output signal;

(j) gating means connected between said pulse generating means and said counter upon advent of the output signal from said first comparing means thereon to stop the passage of pulses to said counter therethrough;

(k) second comparing means receptive of the electrical signals from said adjusting means and said digital-to-analog converting means and responsive to the establishment of a predetermined relationship between the magnitudes of said electrical signals for producing an electrical output signal;

(l) arresting means for said adjusting means arranged upon advent of the output signal from said second comparing means thereon to arrest said adjusting means at a position dependent upon said shutter time and said scene light intensity as said adjusting means is moved from the maximum to minimum possible aperture position;

(m) driving means causing said diaphragm means to be brought into effective exposure aperture-determining engagement with said setting means;

(n) actuating means for actuating said driving means and said adjusting means synchronously with each other in response to the release of said camera;

said apparatus further including:

(o) manually adjustable diaphragm setting means operatively connected to said automatically adjustable diaphragm setting means and having a signal generator arranged upon setting of a diaphragm aperture value to produce an electrical signal with a magnitude proportional to said aperture value;

(p) first change-over means for selecting either said shutter time setting means or said manually adjustable diaphragm setting means for cooperation with said first comparing means;

(q) control means for controlling the shutter of said camera, said control means having:

(1) a first timer cooperative with said shutter setting means for providing a delay time corresponding to the shutter time selected on said shutter time setting means,

(2) a second timer cooperative with said digital-to-analog converting means for providing a time delay corresponding to the output signal of said digital-to-analog converting means, and

(3) selecting means for selectively rendering operative said first and said second timer; and

(r) second change-over means for selecting either said second comparing means or said shutter control means for cooperation with said digital-to-analog converting means.

4,137,542

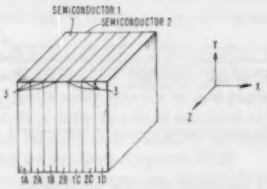
SEMICONDUCTOR STRUCTURE

Leroy L. Chang, Mohegan, and Leo Esaki, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 20, 1977, Ser. No. 789,158

Int. Cl.[2] H01L *29/161*

U.S. Cl. 357—16 **8 Claims**



1. A semiconductor device comprising in combination:

a semiconductor body said body made up of

alternating epitaxial planar regions of at least first and second semiconductor materials exhibiting a difference in semiconductor carrier barrier height at each interface of said planar regions;

each of said planar regions having a thickness dimension less than the mean free path of an electron; and

at least input and output means positioned for introducing current flow in the regions of said body parallel to the interfaces between said regions.

4,137,543

LIGHT DETECTOR ARRANGEMENT

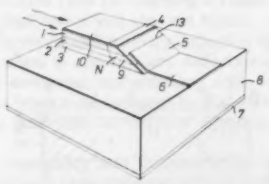
Heinz Beneking, Aachen, Germany, assignor to Licentia Patent Verwaltungs GmbH, Frankfurt am Main, Germany

Filed May 13, 1977, Ser. No. 796,536

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1976, 2624436

Int. Cl.[2] H01L *27/14, 29/161*

U.S. Cl. 357—30 **14 Claims**



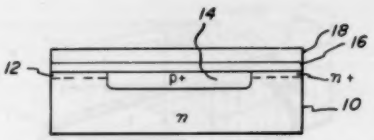
1. In an arrangement including a light wave conductor in which light is conducted through a first semiconductor layer disposed between second and third semiconductor layers having a smaller dielectric constant than that of said first semiconductor layer, and a detector coupled to said light wave conductor for detecting the conducted light; the improvement wherein: said second, first, and third semiconductor layers are disposed sequentially one above the other on a surface of a substrate; said light wave conductor has an edge surface which slopes toward said surface of said substrate; said detector is a semiconductor device formed at least partially within said three semiconductor layers adjacent said edge surface and extending to the upper surface of said third layer; and said detector has a first contact electrode disposed on said edge surface and a second contact electrode disposed on said upper surface of said third layer and adjacent said edge surface.

4,137,544

MERCURY CADMIUM TELLURIDE PHOTODIODE

Toivo Koehler, Lexington, Mass., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jul. 5, 1977, Ser. No. 812,872
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 **8 Claims**



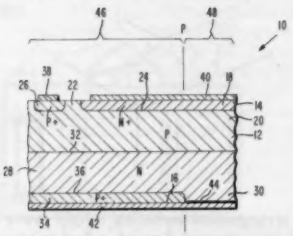
1. A mercury cadmium telluride photodiode comprising:
a body of mercury cadmium telluride having a n-type bulk region therein;
a n-type accumulation region present in the body proximate a first surface of the body, the n-type accumulation region having a greater carrier concentration than does the n-type bulk region;
a p-type region present in the body, the p-type region extending from the first surface into the body, whereby the n-type accumulation region surrounds the p-type region at the first surface;
a first ohmic contact means providing electrical contact to the p-type region; and
a second ohmic contact means providing electrical contact to the n-type bulk region.

4,137,545

GATE TURN-OFF THYRISTOR WITH ANODE RECTIFYING CONTACT TO NON-REGENERATIVE SECTION

Hans W. Becke, Morristown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 16, 1977, Ser. No. 833,751
Claims priority, application United Kingdom, Jan. 31, 1977, 03918/77
Int. Cl.[2] H01L *29/747*
U.S. Cl. 357—39 **6 Claims**



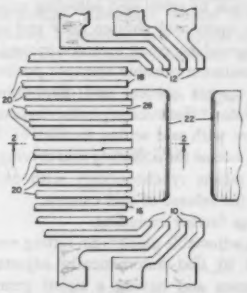
1. A gate controlled semiconductor device comprising:
a body of semiconductor material having therein a four layer regenerative controlled rectifier section and a three layer non-regenerative section,
said four layers of said regenerative section having alternating conductivity types, and comprising a cathode region adjacent a first major surface of said body and having a one type conductivity, an active gate region having a second type conductivity, a base region having said one type conductivity, said base region being spaced apart from said cathode region by said active gate region, and an anode region having said second type conductivity and being adjacent to a second major surface of said body and spaced apart from said cathode region by said gate region and said base region, a portion of said anode region overlapping said cathode region;
said non-regenerative section being adjacent to and integral with said regenerative section, said three layers of said non-regenerative section comprising extensions of said cathode region, said active gate region and said base region, a portion of said base region extending to said second major surface in said non-regenerative section; and
means for rectifyingly contacting said portion of said base region at said second major surface to reduce the lateral current between said regenerative section and said non-regenerative section necessary to initiate current regeneration in said regenerative controlled rectifier section.

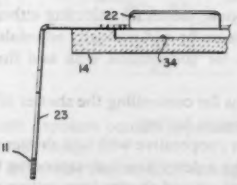
4,137,546

STAMPED LEAD FRAME FOR SEMICONDUCTOR PACKAGES

John M. Frusco, Scotch Plains, N.J., assignor to Plessey Incorporated, Montvale, N.J.

Filed Oct. 14, 1977, Ser. No. 842,322
Int. Cl.[2] H01L *23/48, 29/44, 29/52*
U.S. Cl. 357—70 **10 Claims**



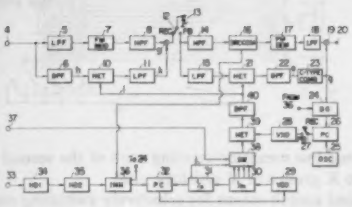


1. In a lead frame for semiconductor packages including a plurality of leads integral with a surrounding frame and extending to a central opening around which the inner tips of said leads converge, the improvements comprising:
the inner tips of at least the longest of said leads being integral with one or more tabs;
said tabs being scored across a break-off line to facilitate removal of same.

4,137,547
DROP-OUT RESPONSIVE MAGNETIC RECORDING AND REPRODUCING SYSTEM

Chojuro Yamamitsu, Kawanishi; Ichiro Arimura, Kyoto; Sadafumi Kitamura, Neyagawa, and Norio Meki, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 17, 1977, Ser. No. 842,883
Claims priority, application Japan, Oct. 19, 1976, 51-125765; Oct. 20, 1976, 51-126590
Int. Cl.² H04N 5/76
U.S. Cl. 358—8 9 Claims



1. A magnetic recording and reproducing system wherein a brightness signal is angular modulated and a carrier color signal is frequency converted to a low frequency side of the modulated brightness signal, said modulated brightness signal and the frequency converted carrier color signal are recorded on a record medium, and in playback, said angular modulated brightness signal is demodulated while said low frequency converted carrier color signal is frequency converted to a high frequency and time axis correction is carried out; said magnetic recording and reproducing system comprising;

an input circuit means to which a synch. signal including at least horizontal synch. signal is applied;

a low frequency carrier generating means connected to said input circuit means for generating a low frequency carrier which is in phase synchronism with said horizontal synch. signal and which has a frequency equal to n times as high as the horizontal frequency;

a gate circuit means for extracting a burst signal from the reproduced carrier color signal by a gate signal which is in phase synchronism with said horizontal synch. signal;

a variable frequency oscillation means for producing an oscillation output which is in phase synchronism with the extracted burst signal;

a carrier generating means for frequency converting said low frequency carrier by the output of said variable frequency oscillation means to produce a carrier to be used in the frequency conversion to said high frequency;

a means for detecting dropout in the reproduced signal; and

an inhibit circuit means connected between at least said input circuit means and said carrier generating means and responsive to the output of said dropout detection means to substantially inhibit the supply of the signal at the horizontal frequency to said low frequency carrier generating means and said burst signal to said variable frequency oscillation means.

4,137,548
METHOD AND APPARATUS FOR OPTIMIZING COLOR PURITY IN A COLOR KINESCOPE

William R. Kelly, and Robert L. Barbin, both of Lancaster, Pa., assignors to RCA Corporation, New York, N.Y.

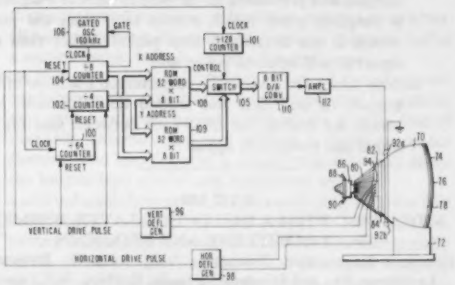
Filed Mar. 31, 1977, Ser. No. 783,478
Claims priority, application United Kingdom, Sep. 30, 1976, 40695/76
Int. Cl.² H04N 9/62
U.S. Cl. 358—10 14 Claims

8. An apparatus for optimizing color purity in a color television picture tube while simulating the effects of error sources, said tube having at least two electron beams and a mosaic of recurring groups of luminescent deposits disposed on a screen, each of said deposits being located at a nominal landing site of an associated electron beam on said screen, said picture tube subject to the effects of error movement from said error sources, said error movement moving the landing site of said associated electron beam from said nominal landing site in a first direction by a first predetermined magnitude in a first region of said raster, said error movement moving said landing site in a second direction by a second predetermined magnitude in a second region of said raster, said apparatus comprising:

mounting means for holding said color picture tube and a color purity adjustment assembly and deflection yoke in operating relationship relative to said picture tube;

a pair of auxiliary deflection coils mounted on said mounting means and responsive to auxiliary deflection signals for developing an auxiliary magnetic field;

means for storing various values of said auxiliary deflection signals representing the various amounts of auxiliary deflection of said electron beam that are required to be produced by said auxiliary magnetic field in said first and second regions of said raster in said first and second directions for creating a simulated expanded electron beam for simulating the error movement of selected ones of said plurality of error sources, the position and width of said simulated expanded electron beam with respect to the nominal landing sites of said electron beam being determined by appropriate selection of said various values;



means for energizing said deflection yoke at normal field and line deflection rates for scanning a raster on said screen with at least one of said electron beams;

means for coupling said auxiliary deflection signals from said storing means to said auxiliary deflection coils;

means for energizing said auxiliary coils with current to cause the beam to be deflected by said various amounts of auxiliary deflection, in said first direction, during a first period;

means for energizing said auxiliary coils with current to cause the beam to be deflected by said various amounts of auxiliary deflection, in said second direction, during a second period, each of said first and second periods comprising at least one vertical field for minimizing the current switching requirements of said auxiliary coils; and

color purity adjusting apparatus for adjusting said tube to a desired degree of color purity.

4,137,549
DPCM CODING APPARATUS

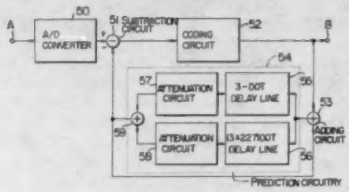
Takeshige Ichida, Hirakata; Kunihiko Hontani, Katano, and Tetsuro Hanaoka, Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 4, 1977, Ser. No. 784,470
Claims priority, application Japan, Apr. 6, 1976, 51-38974
Int. Cl.² H04N 9/02
U.S. Cl. 358—13 9 Claims

1. A DPCM coding apparatus wherein a composite color

video signal is sampled at a frequency which is m times as high as the frequency of the sub-carrier wave, where m is an integer, and wherein the sampled signals are converted to coded digital signals for coding of a prediction value at a selected point, comprising

prediction means for producing a prediction signal including delay means having at least first and second delay circuits, said first delay circuit delaying said coded signals by m dot periods; and said second delay circuit delaying said



coded signals by m × k dot periods, where k is an integer, and producing at the output thereof a signal at a sampling point which occurs later than the point which is one horizontal scan period earlier than the signal at said selected point, and

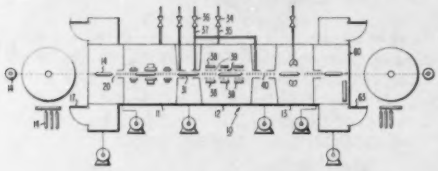
adding means for scanning predetermined fractions of the outputs of said first and second delay circuits, and means for coding the difference between said digital signal and prediction signal.

4,137,550

VIDEO DISC WITH A DIELECTRIC LAYER FORMED FROM ACETYLENE AND NITROGEN

Grzegorz Kaganowicz, Princeton, N.J.; John W. Robinson, Levittown, Pa., and Hirotsugu Yasuda, Durham, N.C., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 18, 1977, Ser. No. 852,928
Int. Cl.[2] H04N *1/28;* B32B *3/02*
U.S. Cl. 358—128 **10 Claims**



1. A capacitive recording means comprising a disc having a spiral groove on a face thereof with audio/video information in the form of geometric variations in said groove, a thin conductive layer thereon and a thin dielectric layer formed from acetylene and nitrogen in a glow discharge on said conductive layer.

4,137,551

CATHODE ADDRESSING SYSTEM

Jan A. Rajchman, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,217
Int. Cl.[2] H04N *5/66;* G08B *5/36*
U.S. Cl. 358—230 **3 Claims**

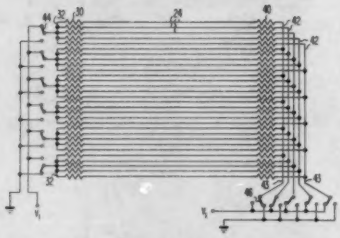
1. A system for addressing a plurality of cathodes in an image display device with one of two different voltage levels, said system comprising:

a plurality of first resistors each being electrically connected to one end of a different cathode;

a first bus means connecting X adjacent first resistors in common to form Y groups wherein X times Y equals the total number of cathodes;

a first switch means for selectively switching one of two different voltage levels to each group of first resistors;

a plurality of second resistors each being electrically connected to the other end of a different cathode;



a second bus means connecting each of the second resistors into X groups of Y resistors; and

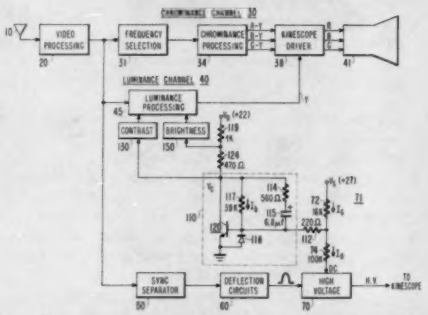
a second switch means for selectively switching one of two different voltage levels to each group of second resistors.

4,137,552

AUTOMATIC BEAM CURRENT LIMITER WITH INDEPENDENTLY DETERMINED THRESHOLD LEVEL AND DYNAMIC CONTROL RANGE

Joseph J. Serafini, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed May 5, 1977, Ser. No. 794,126
Int. Cl.[2] H04N *5/68, 9/16*
U.S. Cl. 358—243 **14 Claims**



1. In a system for processing image representative video signals, said system including a video signal transmission channel and an image reproducing device for reproducing an image in response to video signals transmitted via said channel, apparatus comprising:

a source of current of a given level coupled to said image device for supplying beam current thereto in accordance with the current demand of this device below a threshold level, said given current level corresponding to said threshold level above which it is desired to oppose increases in beam current;

means for deriving a control signal representative of the magnitude of beam current when said threshold level is exceeded, including

active current conducting means having an input coupled to said current source, and an output for providing said control signal;

means for providing degenerative direct current feedback coupled from said output to said input of said active means to determine, for said active means, a dynamic

operating control range when said threshold level is exceeded; and wherein

feedback current provided by said feedback means is proportional to the level of beam current demand in excess of said threshold level, and is supplied to said input of said active means to determine the operation of said active means within said control range and to said image device as additional beam current when said threshold current level is exceeded; and

means for coupling said output control signal to said image reproducing device to oppose increasing current conduction thereof in accordance with the magnitude of said control signal.

4,137,553
METHOD AND APPARATUS FOR MAGNETICALLY RECORDING VEHICLE RUNNING CONDITIONS

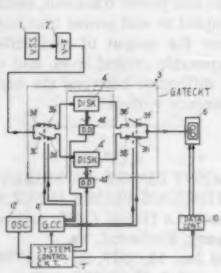
Naoki Tokitsu, Chiryu, and Muneo Saito, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 564,208, Apr. 1, 1975. This application Jan. 3, 1977, Ser. No. 756,065

Claims priority, application Japan, Apr. 9, 1974, 49-41442

Int. Cl.² G01D *1/16, 15/12*

U.S. Cl. 360—6 **3 Claims**



1. A method for magnetically recording vehicle running conditions comprising the steps of:

sensing a vehicle running condition to provide a continuous signal,

converting said signal into a pulse signal varying in frequency in proportion to the magnitude of the sensed running condition,

temporarily memorizing said pulse signals by alternately directing said signals for predetermined intervals to a pair of movable recording means,

alternately moving said recording means at first and second speeds during said intervals whereby when one of said recording means moves at the first speed, the other of the recording means moves at the second speed, said second speed being faster than the first speed,

transferring said temporarily memorized signals from said pair of movable recording means as each moves at said second speed and recording the transferred signals on a movable magnetic recording means, said transferring and recording occurring during further intervals each of which is shorter than one of said predetermined intervals, and

stopping said magnetic recording means between said further intervals.

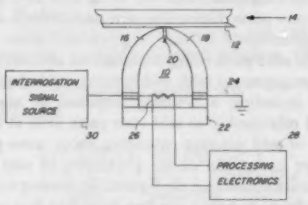
4,137,554
MAGNETIC HEAD EMPLOYING FLUX INTERROGATION

Richard J. McClure, San Diego, Calif., assignor to Eastman Technology Inc., Rochester, N.Y.

Filed Sep. 21, 1977, Ser. No. 835,110

Int. Cl.² G11B *5/34*

U.S. Cl. 360—111 **1 Claim**



1. A magnetic head adapted to produce a signal corresponding to a sensed level of magnetic flux, comprising:

a. first and second magnetic pole pieces, and means structurally cooperating with said pole pieces so that they define a non-magnetic transducer gap therebetween;

b. an elongated electrical conductor secured to and extending between the pole pieces remote from said transducer gap, said conductor having a thin single domain film of magnetic material less than 3 microns in thickness coated thereon, said film forming a closed magnetic path about the longitudinal axis of said conductor; and

c. a coil inductively coupled to said conductor, said thin film covering the outer skin of said conductor, and said film having an easy axis of magnetization which is substantially in the plane of said film and which axis is substantially orthogonal to the length of said conductor, said conductor including means for applying a current having an alternating component passed therethrough, whereby said coil produces a modulated signal, the modulation of which corresponds to the level of flux traversing said pole pieces.

4,137,555
MAGNETIC HEAD

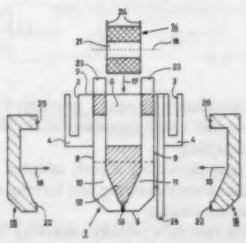
Alfred Sveceny, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 693,945, Jun. 8, 1976. This application Feb. 23, 1978, Ser. No. 880,440

Claims priority, application Austria, Jun. 18, 1975, 4675/75

Int. Cl.² G11B *5/10*

U.S. Cl. 360—129 **4 Claims**



1. A magnetic head comprising:

a non-magnetic unitary housing adapted to house a magnetic system, said housing including first and second opposed walls which together enclose a cavity, said cavity having first and second spaced apart faces disposed substantially normal to said first and second walls, said first face being a tape recording medium contact face, said second face

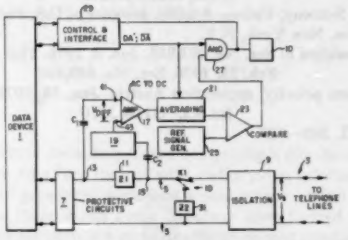
being an open rear face, said first and second opposed walls each having over a part of their length a slot, said slots each extending through one said wall and into said recording medium contact face, said housing including an inner wall part centrally disposed between said first and second walls, said inner wall having a length dimension which is less than the length of said slots and having an edge which is flush with said recording medium contact face, said magnetic head including first and second C-shaped core parts disposed in said slots to form a magnetic circuit interrupted by said edge of said inner wall, said C-shaped core parts being dimensioned and configured for mating engagement with said housing, said magnetic head further including a winding disposed in magnetically coupled relationship to said core parts with at least some portion of said winding extending about some portion of said core parts, said cavity proximate to said rear face being dimensioned and configured for mating engagement with said winding, said winding including first and second ends for cooperation with associated apparatus, said housing positioning said core parts and winding in predetermined fixed relationship and further including means holding said winding, said C-shaped core parts and said housing in mating engagement with each other.

4,137,556

PROTECTION CIRCUIT FOR A DATA TRANSMISSION SYSTEM

Conio Sessa, Fairfield, Conn., assignor to Alpex Computer Corporation, Danbury, Conn.

Filed Sep. 2, 1977, Ser. No. 830,059
Int. Cl.² H02H *3/20*
U.S. Cl. 361—91 **11 Claims**



1. In a data transmission system a protective network coupling a data device and a data transmission circuit, said protective network comprising:

conductive means providing a path adapted to carry data signals simultaneously entering and leaving said device via said transmission circuit;

control means in said data path for receiving the data signals carried by said conducting means and providing a control signal dependent on the magnitude of the data signal leaving said data device and independent of the data signal entering said data device; and

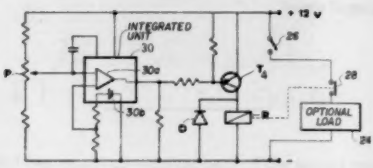
switching means responsive to said control signal for selectively interrupting said data path said switching means being dependent on the magnitude of the data signal leaving said data device.

4,137,557

AUTOMATIC CUT-OUT DEVICE

Giorgio Ciarniello, Vasto, and Oscar De Lena, Termoli, both of Italy, assignors to Societa Italiana Vetro S/V S.p.A., Vasto (Chieti), Italy

Continuation-in-part of Ser. No. 577,563, May 14, 1975, Pat. No. 4,088,940. This application Feb. 13, 1978, Ser. No. 877,380
Claims priority, application Italy, May 15, 1974, 51009 A/74; Feb. 12, 1975, 48126 A/75
Int. Cl.² H02H *3/24*
U.S. Cl. 361—92 **7 Claims**



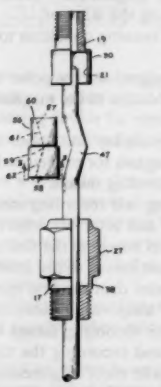
1. A device to cut out non-essential loads in a generator and battery fed electric plant including, in addition to a circuit of essential loads, also a circuit of at least one non-essential load, said device comprising a voltage responsive means connected across terminals of said battery for opening said circuit of at least one non-essential load whenever voltage at said terminals falls below a pre-set level, said voltage responsive means including an integrated unit having means for developing a constant reference voltage and a differential amplifier; a power transistor, said differential amplifier having its output controllably connected to said power transistor; and a normally closed contact relay coupled to said power transistor to be activated thereby whenever the output of said differential amplifier exceeds a pre-adjustable critical level, said output being proportional to the difference between the battery voltage and said constant reference voltage.

4,137,558

INSTRUMENT PROBE ASSEMBLY HAVING CONTINUOUS PROBE INSULATION

Norman V. Beaman, La Habra, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 10, 1977, Ser. No. 758,195
Int. Cl.² H01G *7/00*
U.S. Cl. 361—284 **8 Claims**



1. A probe assembly for mounting in an aperture in the wall of a vessel which comprises:

a. a body having attachment means at one end for securing to said aperture;

b. a through passageway in said body opening to said one end thereof and, substantially coaxially, to the opposite end thereof;

c. an elongated metal solid core, single rod probe member received within said passageway extending through said body and projecting, from said one end whereby said member projects into said vessel when said assembly is mounted in said aperture;

d. a continuous insulating coating coextensive with said probe member;

e. a preformed radial deflection bend in the received portion of said probe member within said housing, a successive, reverse radial deflection bend and a straightening bend in said received portion of said probe member, said deflection bends being limited in angle and radius to avoid fractures in said continuous coating;

f. preformed internal shoulder means within said body having an axial groove with a radially offset center and radially inclined shoulders to receive said bends of said probe member and provide continuous abutments therefor, preventing axial and rotational movement of said probe member in said body.

4,137,559

SOCKET ASSEMBLY

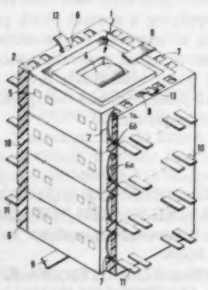
Hans-Werner Reuting, Peine, Fed. Rep. of Germany, assignor to Elmeg-Elektro-Mechanik Gesellschaft mit beschrankter Haftung, Peine, Fed. Rep. of Germany

Filed Jul. 1, 1977, Ser. No. 812,312

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629358

Int. Cl.² H02B *1/04*

U.S. Cl. 361—331 **19 Claims**



1. Socket structure for mounting a plurality of electric and/or electronic circuit elements, comprising:

a quadrilateral socket tube with rectangular or square-shaped cross section being of elongated configuration and being open at its ends;

a plurality of contact springs extending inwardly from the tube and being continued outwardly therefrom for external accessibility, the plurality of contact springs being arranged in several levels in the tube;

a plurality of similar quadrilateral mounting frames not constituting circuit elements or portions thereof themselves and having external dimensions matching the rectangular or square-shaped cross section of the tube to fit into said tube, each frame further having four joined side walls with apertures, all said frames being stacked in the tube by insertion from one of said ends and each having a height commensurate with said levels of said contact springs in the tube;

contacts mounted in the frames and extending outwardly through the apertures in the side walls of the respective frame, said contacts clamping and making engagement with the said contact springs of the tube, said contacts extending also into the interior of the frames; and

circuit elements disposed and mounted in the frames and being electrically connected to the contacts as extending into the frames.

4,137,560

MULTIPHASE FULL-WAVE RECTIFIER ASSEMBLY

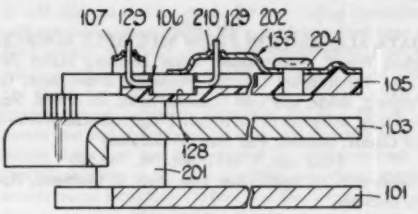
Alan R. Moore, Walsall, England, assignor to Lucas Industries Limited, Birmingham, England

Filed May 22, 1978, Ser. No. 908,139

Claims priority, application United Kingdom, Oct. 29, 1977, 45151/77

Int. Cl.² H02M *7/06*

U.S. Cl. 363—145 **5 Claims**



1. A multiphase, full-wave rectifier assembly, comprising a first plate, a second plate substantially parallel to the first plate, first and second sets of diodes carried by the first and second plates respectively, terminals of the first set of diodes extending through holes in the second plate, connector electrically interconnecting said terminals of each diode of the first set with a respective diode of the second set a support structure in the form of an electrically insulating body having recesses therein, a further set of diodes disposed respectively in said recesses, said recesses being shaped so as to hold the diodes of the further set in predetermined relative positions, one of the terminals of each diode of the first set being electrically connected with a respective one of the connectors, and a common connector connecting together the other terminals of the diodes of the further set, wherein the common connector is shaped so that portions thereof overlie said recesses in the electrically insulating body so that the diodes of the further set are retained in said recesses by said portions of the common connector.

4,137,561

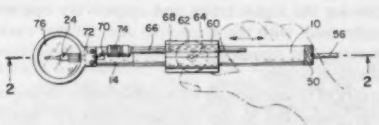
MAGNIFYING HAND TOOL WITH SELF-CONTAINING ILLUMINATING MEANS

George C. Andree, 528 Willow St., West Hempstead, N.Y. 11552

Filed Feb. 2, 1977, Ser. No. 764,832

Int. Cl.² F21V *33/00*

U.S. Cl. 362—119 **2 Claims**



1. A hand tool having integral illumination means, adjustable magnification means, a chuck for receiving interchangeable workpiece modifying tool elements;

and a hollow cylindrical elongated support member adapted to be held in the crook of the hand having electrically energizable illumination means at one end thereof with a terminal means extending into the support member;

the improvement comprising:

(a) a bracket affixed to said support member;

(b) a shaft rotatably mounted in said bracket perpendicular to said support member;

(c) a thumbwheel fixed to said shaft rotatably mounted in said bracket, said thumbwheel having diametrically opposed portions extending from said bracket;

(d) a pinion gear carried by said shaft above said thumbwheel relative to said support member;

(e) a rack above said thumbwheel translatably secured to said bracket engaging said pinion gear and carrying said magnification means for adjustably positioning same, said rack arranged to move parallel to said support member.

4,137,562

DATA ACQUISITION FROM MULTIPLE SOURCES

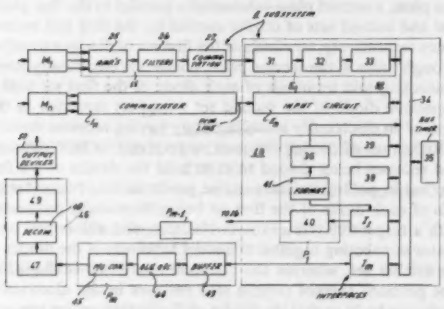
Joachim Boeck, Ganderkesee; Peter Dunker, Stuhr; Jurgen Fryen, Kirchweyhe; Dietrich Neumann, Bruchhofen; Georg Pattberg, Stuhr, and Udo Wieseke, Syke, all of Fed. Rep. of Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Fed. Rep. of Germany

Filed Apr. 7, 1977, Ser. No. 785,585

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1976, 2615306

Int. Cl.[2] G06F *3/05*

U.S. Cl. 364—200 **18 Claims**



1. A data acquisition system having a plurality of transducers whose outputs are to be acquired, comprising:

a plurality of independently and parallelly operating commutators each connected to and cyclically interrogating some of the transducers of the plurality in independent cycles and each providing an unbuffered PCM signal train, there being a plurality of independent and parallel PCM signal trains accordingly;

A plurality of decommutators connected for respectively receiving the signal trains and respctively operating in synchronism with the respective commutator cycles for separating the signals in accordance with their respective transducer origin;

a plurality of independently addressible buffer means respectively connected to the decommutators for storing the separated signals as data in individually addressible locations;

means included in each buffer means for accessing the locations in synchronism with the decommutation cycles;

a common data bus connected to all of the buffer means of the plurality of buffer means; and

a plurality of independently operating processors connected to the bus, each having independent access to all said buffer means of the plurality to extract therefrom the signals as stored for processing.

4,137,563

CIRCUITRY FOR REDUCING POWER DISSIPATION IN EQUIPMENT WHICH OPERATES IN SYNCHRONISM WITH CLOCK PULSES

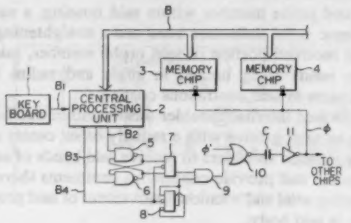
Takashi Tsunoda, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1977, Ser. No. 807,656

Claims priority, application Japan, Jun. 30, 1976, 51-77186

Int. Cl.[2] G06F *1/04, 13/00*; G11C *7/00*

U.S. Cl. 364—200 **12 Claims**



1. An electronic equipment comprising:

storage means for storing data in synchronism with clock pulses applied thereto;

control signal generating means for generating a first control signal during periods when the stored data is to be read-out from said storage means, and for generating a second control signal during a hold cycle of said storage means when the stored data is not to be read-out therefrom; and

clock pulse applying means coupled to said storage means and said control signal generating means for applying a first clock pulse train to said storage means in response to the first control signal from said control signal generating means, and applying a second clock pulse train to said storage means in response to the second control signal from said control signal generating means, wherein said second clock pulse train has a fewer number of clock pulses during a predetermined time period as compared to said first clock pulse train.

4,137,564

INTELLIGENT COMPUTER DISPLAY TERMINAL HAVING EAROM MEMORY

David H. Spencer, Lebanon, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Aug. 22, 1977, Ser. No. 826,513

Int. Cl.[2] G06F *3/04, 3/14, 13/00*

U.S. Cl. 364—200 **10 Claims**

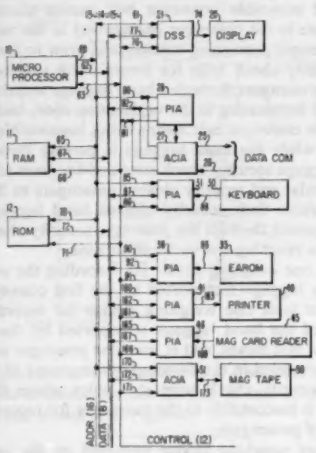
1. An intelligent display terminal for receiving character data information from an external computer and providing a visual display of linguistic characters in response to such character data information, said display terminal having the capability to be semipermanently configured in response to externally supplied configuration information and comprising;

a microprocessing unit comprising an electronic data processor, a read only memory that is nonvolatile at power off for providing instruction codes for said processor, and a read/write memory that is volatile at power off for providing temporary storage for data;

data communication means that interface with said microprocessing unit, said data communication means for receiving the character information from the external computer at a given bit rate and providing said character information to said microprocessing unit so that the character information can be stored in the volatile read/write memory of said microprocessing unit;

visual display means that interface with said microprocessing unit, said visual display means for visually displaying linguistic characters stored in the volatile read/write memory of said microprocessing unit;

input means that interface with said microprocessing unit, said input means for inputting said externally supplied configuration information including the bit rate of the data communication means into said microprocessing unit; and electrically alterable read only memory means that interface with said microprocessing unit, said electrically alterable

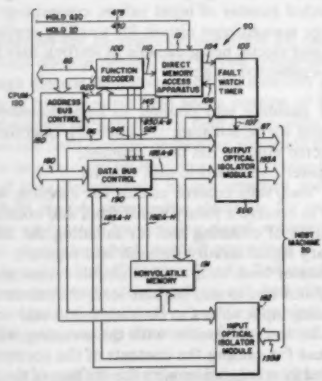


read only memory means for receiving and storing the bit rate of the data communication means from said microprocessing unit and for providing the stored bit rate to said microprocessing unit upon request therefor, said electrically alterable read only memory means being nonvolatile at power off.

4,137,565
DIRECT MEMORY ACCESS MODULE FOR A CONTROLLER

George E. Mager, Manhattan Beach; Frank M. Nelson, Sherman Oaks; Kenneth Gillett, Redondo Beach; Charles P. Holt, Palos Verdes, all of Calif.; Edward L. Steiner, Macedon; John W. Daughton, Fairport, both of N.Y.; Kenton W. Fiske, Palos Verdes; Thomas Criswell, Venice, both of Calif., and Warren L. Hall, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1977, Ser. No. 758,117
Int. Cl.[2] C06F *13/00*
U.S. Cl. 364—200 29 Claims



1. A computerized controller having direct memory access data capability for directing control registers of a host machine comprising;

(a) microprocessor means for manipulating data according to a given program, and for providing the manipulated data and enabling addresses;

(b) system bus means operative to normally be under the control of said microprocessor means for bidirectionally carrying said manipulated data and enabling addresses from said microprocessor means;

(c) data memory means coupled to receive the manipulated data from said system bus means for storing and for writing of data that has been stored onto said system bus means; and

(d) direct memory access means operative to receive a predetermined enabling address on said system bus means from said microprocessor means for issuing a hold signal to said microprocessor means for suspending operation of said microprocessor means for a predetermined time and upon receipt of a hold acknowledgement signal from said microprocessor means for assuming control of said system bus means for outputting active state control signals and predetermined accessing addresses on said system bus means that will directly access said data memory means to obtain data that has been stored to update-refresh the control registers in the host machine, said direct memory access means including: (1) function decoder means operative to receive address bus signals on said system bus means from said microprocessing means for recognition of predetermined addresses, for generating signals for enabling direct memory access, and for controlling writing of said data memory means data into said system bus means; (2) address bus controller means operative to receive update-refresh addresses from said direct memory access means and for merging of the update-refresh addresses onto the respective address bus lines of said system bus means upon receipt of an active state control signal from said direct memory access means; (3) multiplexing means operative to receive multi-source data from the controller for selection of data signals as the current access by a control signal from said function decoder means, and for outputting the selected data signals onto said system bus means; (4) first shift register means adapted to admit the selected data signals from said multiplexing means for buffer latching for providing stabilized data upon receipt of a written control signal from said function decoder means; (5) tristate driver means disposed to accept the stabilized data from said shift register means for normal flow through said system bus means, and for obstruction thereof upon receipt of an active-state control signal from said direct memory access means; and (6) second shift register means adapted to admit data signals on said system bus means from said microprocessor means and from said tri-state driver means for buffer latching the data signal representing the current access for stabilized data upon receipt of a write control signal from said function decoder means.

4,137,566
APPARATUS AND METHOD FOR ANALYZING A GOLF SWING AND DISPLAYING RESULTS

Steven L. Haas, Marion; Norman O. Fonteneau; Paul F. Sullivan, both of Acushnet; Hoyt C. Hottel, Jr.; Robert A. Brown, both of Mattapoisett; William Gobush, North Dartmouth; John W. Jepson, Marion, and Francis deS. Lynch, Mattapoisett, all of Mass., assignors to Acushnet Company, New Bedford, Mass.

Filed Sep. 12, 1977, Ser. No. 832,565
Int. Cl.[2] G06G *7/48;* A63B *53/00*
U.S. Cl. 364—410 17 Claims

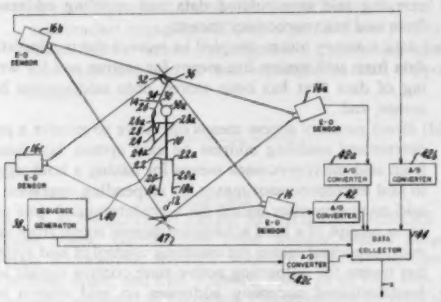
1. Apparatus for analyzing a gold swing by a golfer holding a golf club comprising:

(a) at least first and second electro-optical sensors having

different fields of view encompassing said golfer and golf club during at least a portion of said golf swing;

(b) optical means for marking at least some significant body locations on said golfer and said golf club;

(c) means for determining the three-dimensional location of at least some of said optically marked locations at selected time intervals;



(d) means for storing said three-dimensional locations;

(e) means for displaying a time history of at least some of said stored three-dimensional locations; and

(f) said at least first and second electro-optical sensors having sensing axes located at least 30 degrees apart.

4,137,567

SYSTEM FOR PASSENGER AND LUGGAGE PROCESSING AT COMMERCIAL AIRPORTS

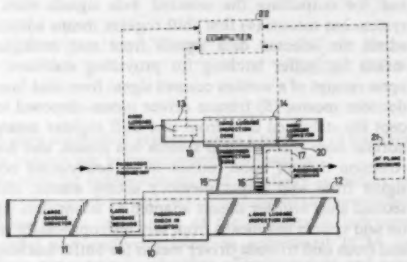
Hans J. Grube, 830 Riven Rock Rd., Santa Barbara, Calif. 93108

Filed Oct. 21, 1975, Ser. No. 624,390

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1974, 2450567

Int. Cl.[2] G01G *11/14;* G08B *29/00;* B65G *67/00*

U.S. Cl. 364—567 **7 Claims**



1. A new and improved system for processing passengers and their luggage at civil airports including a passenger processing counter for verifying airline tickets and confirming passenger identity, equipment for conveying large luggage to be separately stowed aboard the plane from the counter to the plane and installations for performing a security check of both the passengers and their hand luggage, said system comprising:

(a) first moveable conveyor belt means extending alongside the passenger processing counter and alongside a passenger passageway for passengers approaching the counter for processing, said first moveable conveyor belt means being in close proximity to said counter and accessible to passengers in the passageway in advance of the counter but inaccessible to passengers from a passenger check-in station at the counter to a point of pick-up and handling by airport personnel;

(b) a passenger security check zone in which a personal security check of the individual passengers is provided, said passenger security check zone being designed in the manner of a one-way gate for allowing only one-way travel of passengers through the passenger passageway from a point immediately following the passenger check-in station at the counter through to a verification zone which immediately follows the passenger security check zone and where a passenger is considered cleared from a security standpoint;

(c) second moveable conveyor belt means accessible to passengers in the passenger passageway in the vicinity of the passenger processing counter and prior to the passenger security check zone for transporting said hand luggage of passengers through a hand luggage security check zone and terminating in the verification zone, said second moveable conveyor belt means being inaccessible to passengers while the hand luggage is passing through the hand luggage security check zone and becomes accessible to particular and security cleared passengers so that they may retrieve their security cleared hand luggage after having passed through the passenger security check zone and upon reaching the verification zone;

(d) at least one weighing device for recording the weight of the large luggage transported by the first conveyor belt means, at least one weighing device for recording the weight of the hand luggage transported by the second conveyor belt means, and at least one passenger weighing device provided in the passenger passageway of the passenger security check zone at a point where the hand luggage is inaccessible to the passenger for recording the weight of passengers;

(e) a further weighing device provided on the passenger pathway to the plane immediately adjacent to the plane entrance for recording the weight of all of the passengers plus their hand luggage as the plane is loaded; and

(f) weight analyzing means for receiving and correlating the weights recorded for the large luggage, the hand luggage and the individual passengers at the passenger check-in station with their weight at the point of plane loading whereby any discrepancies between the recorded weights at the point of passenger check-in and the weights obtained from said further weighing device can be readily determined.

4,137,568

CIRCUIT FOR ESTABLISHING THE AVERAGE VALUE OF A NUMBER OF INPUT VALUES

Daniel F. Dlugos, Huntington, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Apr. 11, 1977, Ser. No. 786,411

Int. Cl.[2] G06F *7/54;* G01G *23/42*

U.S. Cl. 364—734 **8 Claims**

1. An averaging circuit for use in a system including a source of clock pulses, said averaging circuit for establishing an average of a selected number of input values, comprising:

a multistage accumulator circuit for totalling applied input values, said circuit being capable of shifting data between serially-connected stages;

a counter;

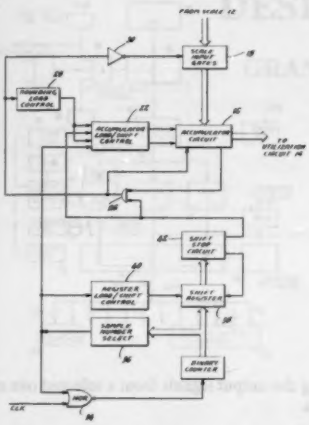
means for enabling said counter to begin counting clock pulses and for terminating the counting operation when the selected number has been counted;

a shift register connected to said counter;

a register load/shift control circuit for enabling said shift register to receive a binary signal from said counter at the termination of counting and for initiating the shifting of the binary signal serially through said register;

an accumulator load/shift control circuit connected to said accumulator and to said register load/shift control circuit for causing input values to be loaded into said accumulator circuit in synchronism with the counting with clock pulses and for causing the contents of the accumulator to be shifted in synchronism with the shifting of the contents of said shift register to effect a binary division of the accumulator contents; and

shift stop means connected to said accumulator load/shift control circuit and to said shift register for responding to



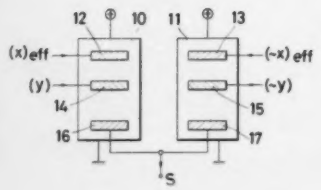
the presence of a binary signal at a selected stage of said device to inhibit further shifting in said accumulator circuit and in said shift register.

4,137,569

LOGIC CIRCUIT SYSTEM USING HIGH ELECTRIC FIELD DOMAIN

Yasuo Komamiya, Yokohama; Hiroshi Tateno; Shoei Kataoka, both of Tanashi, and Morisue Mititada, Yono, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 30, 1977, Ser. No. 783,025
Claims priority, application Japan, May 27, 1976, 51-60663
Int. Cl.[2] G06F *7/385*
U.S. Cl. 364—784 **3 Claims**



1. A method for exclusive-or operation by use of a high electric field domain device, said device comprising first and second high electric field domain circuit elements each having a portion of high electric field and a portion of low electric field, said portion of high electric field having attached thereto a high electric field domain-generating electrode for causing a domain to be generated by applying signal voltage thereto, said portion of low electric field having attached thereto a high electric field domain-suppressing electrode for causing a domain to be suppressed by applying signal voltage thereto and an output electrode, which method comprises:

applying a signal of affirmation (y) of a first signal (y) to said domain-suppressing electrode of said first circuit element and a signal of negation (~y) of the first siganl (y) to said domain-suppressing electrode of said second circuit element;

then applying an effective signal $(x)_{eff}$ of a signal of affirmation (x) of a second signal (x) to said domain-generating electrode and an effective signal $(\sim x)_{eff}$ of a signal of negation (~x) of the second signal (x) to said domain-generating electrode; and

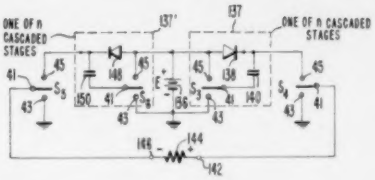
detecting the presence of high electric field domains generated in said first and second circuit elements for thereby obtaining the exclusive-or of said first and second signals (y, x).

4,137,570

WAVEFORM SYNTHESIZER

Richard H. Baker, Bedford, Mass., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 31, 1977, Ser. No. 846,697
Int. Cl.[2] H02M *7/537*
U.S. Cl. 363—43 **17 Claims**



1. A circuit for inverting a DC voltage to an AC voltage having a predetermined waveform, comprising:

first and second terminals for receiving said DC voltage, said second terminal also being connected to a point of reference potential;

first and second level shifting stages each having first and second input terminals connected to said first and second terminals of said inverting circuit, respectively, and an output terminal, each being operable to a first condition for applying said DC voltage to its respective output terminal, and to a second condition for applying a voltage greater in level than said DC voltage to its respective output terminal;

first and second switching means each having a first input terminal connected individually to the output terminals of said first and second level shifting stages, respectively, a second input terminal connected in common to said second terminal of said inverting circuit, and an output terminal for individual connection to one and the other ends of a load, respectively, each one of said switching means providing a single-pole-double-throw switching action, each one of said switching means being operable to a first condition for providing a current conduction path between their respective first input and output terminals, and to a second condition for providing a current conduction path between their respective second input and output terminals; and

means for selectively operating said first and second level shifting stages, and said first and second switching means,

into different combinations of their first and second conditions, for obtaining said AC voltage.

4,137,571

PROGRAM CONTROL APPARATUS FOR THE PHOTOGRAPHIC OPERATING SEQUENCE OF AN X-RAY PHOTOGRAPHIC INSTALLATION

Rolf Pfeifer, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

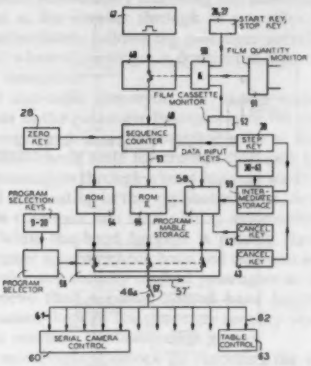
Filed Apr. 26, 1977, Ser. No. 791,060

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1976, 2647928

Int. Cl.[2] G11C *11/42*

U.S. Cl. 365—49 **6 Claims**

1. Program control apparatus for the photographic operating sequence of an x-ray photographic installation comprising a series of memory circuits for storing respective photographic program sequences, a resettable pulse counter being connected with the address input of each of said memory circuits for sequentially selecting the program steps of the respective memory circuits, a pulse generator for supplying program signals to the pulse counter for sequentially selecting the program steps of the respective memory circuits, and a program selection circuit connected with the outputs of the memory circuits for



transmitting the output signals from a selected one of the memory circuits.

DESIGN PATENTS

GRANTED JAN. 30, 1979

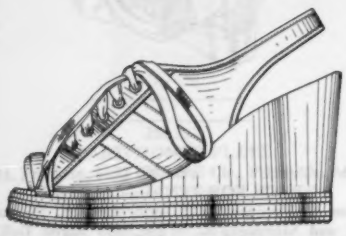
ERRATA

For CLASS	See PATENT NO.
D17–22	250,971

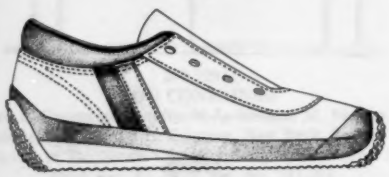
DESIGNS

JANUARY 30, 1979

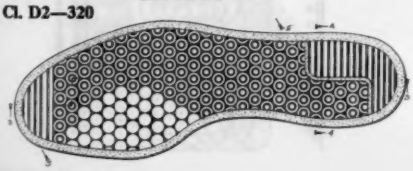
250,916
LACED OPEN TOE WEDGIE
Norman H. Finn, Waban, Mass., assignor to The United States Shoe Corporation, Cincinnati, Ohio
Filed Dec. 7, 1977, Ser. No. 858,464
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—286



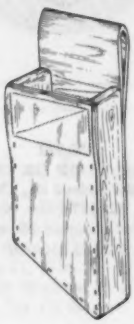
250,917
SHOE
Donald F. Wynne, Naugatuck, Conn., assignor to Uniroyal, Inc.
Filed Jun. 13, 1977, Ser. No. 806,230
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309



250,918
SOLE FOR FOOTWEAR
Dennis P. Dolinsky, Naugatuck, Conn., assignor to Uniroyal, Inc.
Filed Feb. 3, 1977, Ser. No. 765,506
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—320

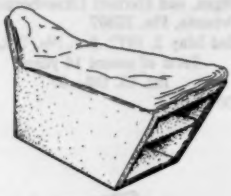


250,919
UTILITY BELT HOLSTER
William N. Milligan, and Herbert Litzenberger, both of Rte. 4, Box 855-B, Orlando, Fla. 32807
Filed May 2, 1977, Ser. No. 792,675
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400

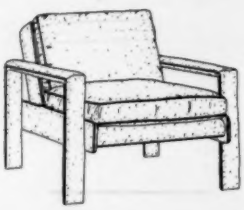


250,920
SPEAKERS LECTERN
Earl E. Waters, Rte. 2, Box 503, Goldsboro, N.C. 27530
Filed Apr. 4, 1977, Ser. No. 783,982
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27

250,921
DENTAL CHAIR
J. Dawson Ruby, R.D. #1, P.O. 540-A, Hopwood, Pa. 15445
Filed Mar. 17, 1977, Ser. No. 778,741
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—58

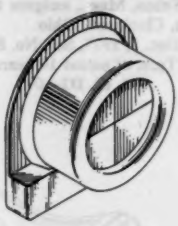


250,922
LOUNGE CHAIR OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Jan. 12, 1977, Ser. No. 758,679
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

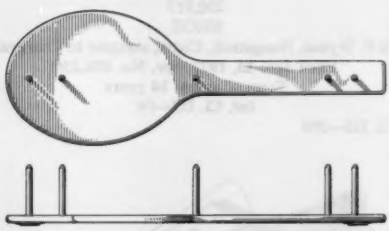


250,923
CHAIR
Gunter Eberle, Dallas, Tex., assignor to Vecta Contract, Inc., Dallas, Tex.
Division of Ser. No. 747,401, Dec. 3, 1976. This application Feb. 23, 1978, Ser. No. 880,848
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

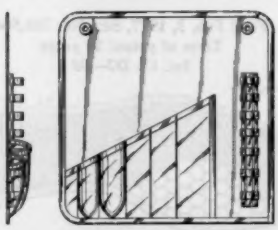
250,924
CLIP-ON TOWEL HOLDER
John D. Helsm, Dallas, Tex., assignor to Matchpoint Industries, Inc., Farmers Branch, Tex.
Filed Jan. 7, 1977, Ser. No. 757,645
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—99



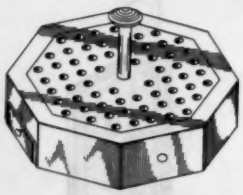
250,925
RACK FOR TENNIS RACKETS
Mary Ann B. Flanigan, 1115 Ashbridge Rd., Rosemont, Pa. 19010, and Maryanne G. White, 653 Baron DeKalb Rd., Wayne, Pa. 19087
Filed Feb. 2, 1977, Ser. No. 765,007
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



250,926
TOOL POUCH
Stanley W. Perkins, Orangeburg, S.C., assignor to Utica Tool Company, Inc., Orangeburg, S.C.
Filed Mar. 2, 1977, Ser. No. 773,383
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—131

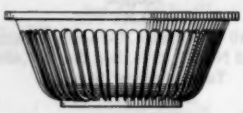


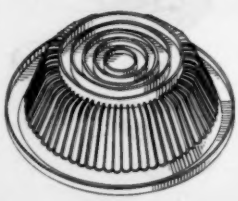
250,927
CRAYON DISPLAY UNIT
Donald W. Lewis, Box 164-11th Ave. North Payette, Id. 83661
Filed May 2, 1977, Ser. No. 793,088
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—146



250,928
PARTITIONED PLATE
Donald M. Franklin, 4132 Balmoral Cir., Pikesville, Md. 21208
Filed Mar. 14, 1977, Ser. No. 777,305
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—27

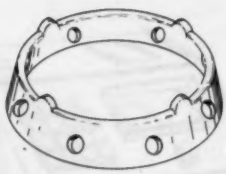
250,929
FOOD CONTAINER
Richard B. Gerstman, Tenafly, N.J.; Herbert M. Meyers, New Rochelle, and Richard C. Edstrom, New York, both of N.Y., assignors to The Nestle Company, Inc., White Plains, N.Y.
Filed Apr. 27, 1977, Ser. No. 791,291
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—28



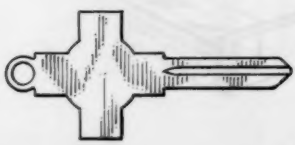


250,930
BOWL
Donald M. Franklin, 4132 Balmoral Cir., Pikesville, Md. 21208
Filed Mar. 14, 1977, Ser. No. 777,304
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—36

250,931
GAS SAVING GRATE
Ronald T. Pierce, 904 Lincoln Dr. West, Ambler, Pa. 19002
Filed May 11, 1976, Ser. No. 685,435
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—136



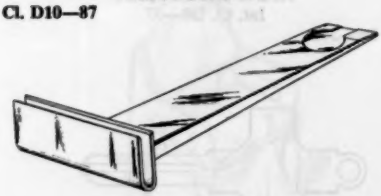
250,932
CRUCIFORM KEY BLANK
Rudolph E. Anderson, 4128 Wabash Ave., #6, San Diego, Calif. 92104
Filed May 26, 1977, Ser. No. 800,738
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—348



250,933
SEAM-FREE CAN BODY
William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.
Division of Ser. No. 565,093, Apr. 4, 1975. This application Jun. 8, 1977, Ser. No. 804,749
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—218

250,934
DIGITAL DARKROOM TIMER
Howard M. Fannin, 540 La Veta Park Clr., Apartment 30, Orange, Calif. 92668
Filed Dec. 6, 1976, Ser. No. 748,148
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40

250,935
LETTER SCALE
Tor Lokvig, 17821 Miranda St., Encino, Calif. 91316
Filed Jan. 31, 1977, Ser. No. 764,053
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—87



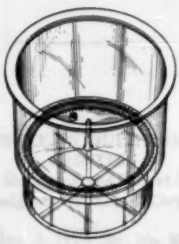
250,936
REFLECTORIZED MARKER
Arthur P. Schueler, Schaumburg, Ill., assignor to Astro Optics Corporation
Filed Feb. 8, 1978, Ser. No. 876,184
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

250,937
REFLECTORIZED MARKER
Arthur P. Schueler, Schaumburg, Ill., and Robert I. Nagel, Mesa, Ariz., assignors to Astro Optics Corporation
Filed Dec. 2, 1977, Ser. No. 857,004
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111

250,938
JEWELRY PIN
Joan Sumner, 3310 Oro Blanco, Colorado Springs, Colo. 80917
Filed Nov. 1, 1976, Ser. No. 737,659
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—49

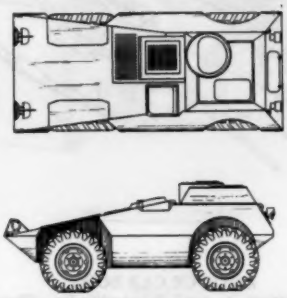
250,939
PENDANT OR SIMILAR ARTICLE
Josef J. Barr, 293 S. County Rd., Palm Beach, Fla. 33480
Filed Sep. 22, 1976, Ser. No. 725,474
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—79

250,940
PLANT CONTAINER
Bervin W. Magee, and Betty A. Magee, both of 416 N. 4th Ave., Maywood, Ill. 60153
Filed Nov. 3, 1976, Ser. No. 738,459
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—152

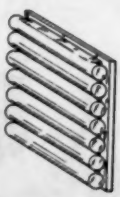


250,941
SEA SHELL FIGURINE
Stephen J. Rudy, 107 Overlook Dr., Greenwich, Conn. 06830
Filed Feb. 18, 1977, Ser. No. 769,880
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—158

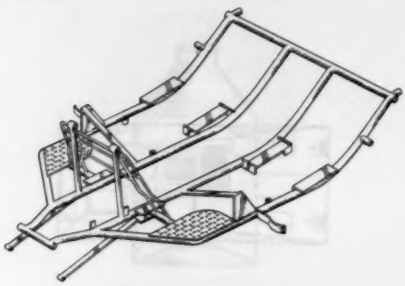
250,942
ARMORED VEHICLE
Irving Appelblatt, West Bloomfield, Mich., assignor to Cadillac Gage Company
Filed Mar. 25, 1977, Ser. No. 781,349
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12



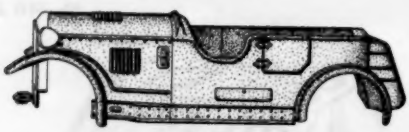
250,943
SOLE FOR FOOTWEAR
Giovanni Bergamaschi, 9, Via Madonna degli Angeli, Vigevano, Pavia, Italy I 27029
Filed Oct. 11, 1977, Ser. No. 841, 532
Term of patent 14 years
Int. Cl. D12—*04*
U.S. Cl. D2—320



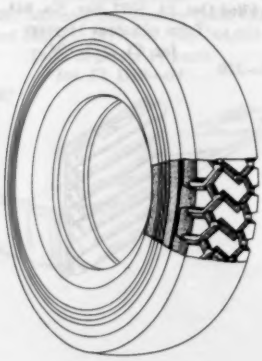
250,944
VEHICLE FRAME
George C. Moore; Jodele Moore, both of Las Vegas, Nev., and James M. Tipke, Spokane, Wash., assignors to Western Rickshaws, Inc., Las Vegas, Nev.
Filed Apr. 4, 1977, Ser. No. 783,972
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—85



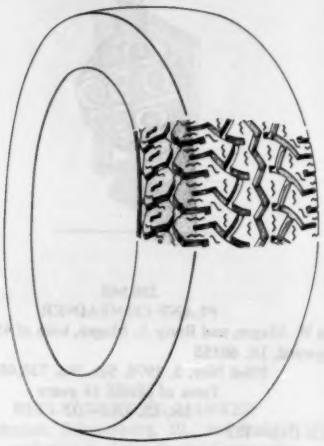
250,945
ANTIQUE CAR BODY
Conrad K. Weiffenbach, 5483 Shimerville Rd., Clarence, N.Y. 14031
Filed May 21, 1976, Ser. No. 688,857
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



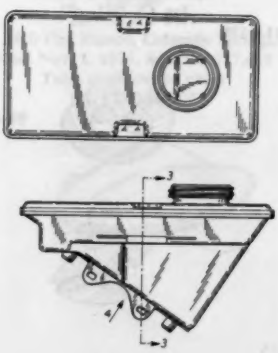
250,946
TIRE
Bernard Germain, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France
Filed Jun. 3, 1977, Ser. No. 803,397
Claims priority, application France, Dec. 17, 1976, 76.522
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



250,947
PNEUMATIC TIRE TREAD AND BUTTRESS
Dionysius J. Poque, Aachen, Fed. Rep. of Germany, assignor to Uniroyal Aktiengesellschaft, Fed. Rep. of Germany
Filed Apr. 15, 1977, Ser. No. 787,740
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 3156
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



250,948
LIQUID RESERVOIR PRIMARILY FOR USE IN A VEHICLE BRAKING SYSTEM
John F. Pickering, Solihull, England, assignor to Girling Limited, Birmingham, England
Filed Jan. 19, 1977, Ser. No. 760,545
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



250,949

PNEUMATICALLY-OPERATED SWITCH

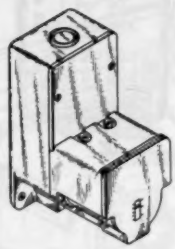
Robert D. Reis, Hingham, Mass., assignor to United Electric Controls Company, Watertown, Mass.

Filed Dec. 16, 1976, Ser. No. 750,955

Term of patent 14 years

Int. Cl. D13—*03*

U.S. Cl. D13—32



250,950

CONTROL CONSOLE MODULE FOR A COMPUTER PRINTER

Ruediger W. Knodt, Rochester, and Robert E. Warren, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1977, Ser. No. 802,755

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—42

250,951

COMPUTER SYSTEM

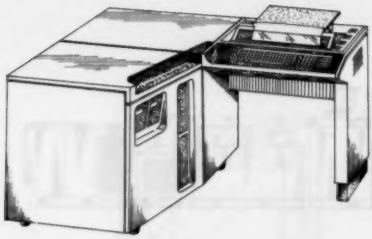
Richard G. Clayton, Detroit, and Jerry J. Sims, Southfield, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 27, 1977, Ser. No. 791,292

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—44



250,952

MODULAR COMPUTER PRINTER

James R. Spowart, Plano, Tex.; Robert E. Warren, Penfield, and Ruediger W. Knodt, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1977, Ser. No. 802,599

Term of patent 14 years

Int. Cl. D14—*02*

U.S. Cl. D14—50

250,953

MODULAR COMPUTER PRINTER

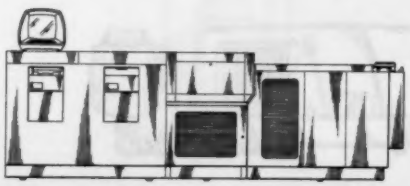
Ruediger W. Knodt, Rochester; Robert E. Warren, Penfield, both of N.Y., and James R. Spowart, Plano, Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1977, Ser. No. 802,618

Term of patent 14 years

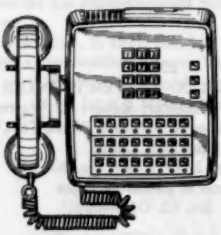
Int. Cl. D14—*02*

U.S. Cl. D14—50

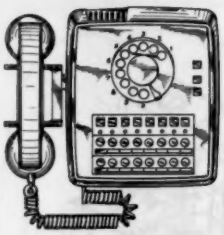


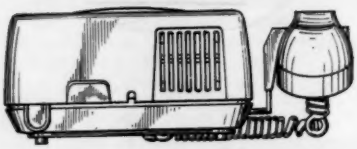
250,954
MODULAR COMPUTER PRINTER
Ruediger W. Knodt, Rochester; Robert E. Warren, Penfield, both of N.Y., and James R. Spowart, Plano, Tex., assignors to Xerox Corporation, Stamford, Conn.
Filed Jun. 2, 1977, Ser. No. 802,619
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—50

250,955
TELEPHONE UNIT
Hironori Yoshikawa, Hirakata, Japan, assignor to Iwatsu Electric Co. Ltd., Tokyo, Japan
Filed Aug. 30, 1976, Ser. No. 725,291
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58

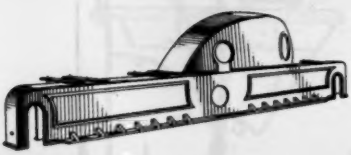


250,956
TELEPHONE UNIT
Hironori Yoshikawa, Hirakata, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan
Filed Aug. 30, 1976, Ser. No. 725,292
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—58

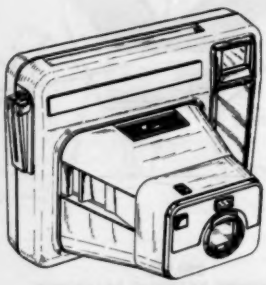




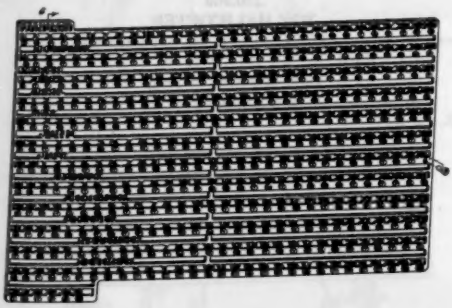
250,957
CHAIN GUARD FOR AN IRRIGATION IMPLEMENT
Bobbie G. Palmer, Lubbock, Tex., assignor to Perow Manufacturing Co., Inc.
Filed May 9, 1977, Ser. No. 794,754
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—28



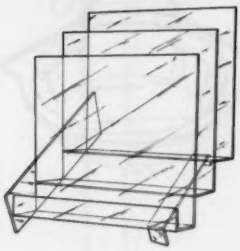
250,958
PHOTOGRAPHIC CAMERA OR SIMILAR ARTICLE
David E. Hansen, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 21, 1977, Ser. No. 779,457
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—06



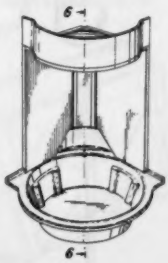
250,959
PERPETUAL CALENDAR
Wilmar L. Prescott, 105 W. Sola Street, Santa Barbara, Calif. 93101
Filed Nov. 29, 1976, Ser. No. 745,522
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—25



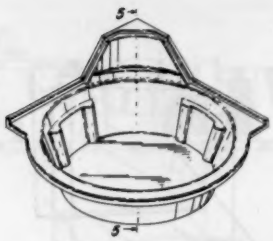
250,960
DESK FILE
Kenneth M. Bitner, Jr., 502 E. 8th St., Sheridan, Ind. 46069; Robert E. Murray, 8735 N. Pennsylvania, Indianapolis, Ind. 46240, and Charles R. Hodges, 819 Knollwood Dr., Greenwood, Ind. 46142
Filed Mar. 14, 1977, Ser. No. 776,954
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—90



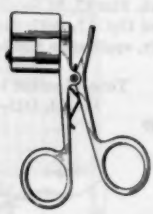
250,961
COMBINED BATHTUB AND SHOWER STALL
Horst G. Bonsack, Flat 17, 51 South St., London W.1, England
Filed Oct. 17, 1977, Ser. No. 842,954
Claims priority, application United Kingdom, Apr. 27, 1977, 979828
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—49



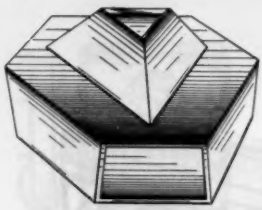
250,962
BATHTUB
Horst G. Bonsack, Flat 17, 51 South St., London, W.1, England
Filed Oct. 17, 1977, Ser. No. 842,955
Claims priority, application United Kingdom, Apr. 27, 1977, 979827
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55



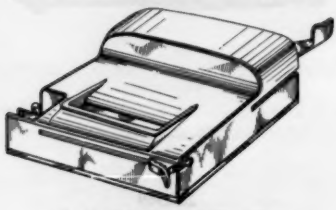
250,963
UROLOGICAL INSTRUMENT HANDLE
Donald J. Mosior, Mundelein, Ill., assignor to American Hospital Supply Corporation
Filed Oct. 8, 1976, Ser. No. 730,991
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—27



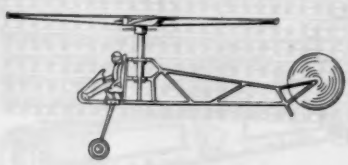
250,964
MODULAR BUILDING STRUCTURE
Clifford C. Whitney, Jr., 3620 Springbrook, Dallas, Tex. 75205
Filed Nov. 1, 1976, Ser. No. 737,892
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—4



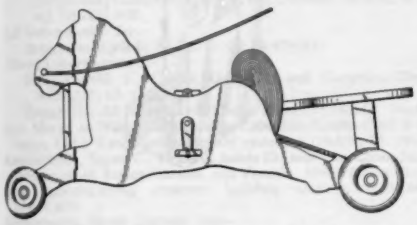
250,965
CIGARETTE MAKING MACHINE
Herman Moscovitch, 2359 de Maisonneuve Blvd. East, Montreal, Quebec, Canada
Filed Apr. 4, 1977, Ser. No. 784,548
Claims priority, application Canada, Jan. 11, 1977, 1101773
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51



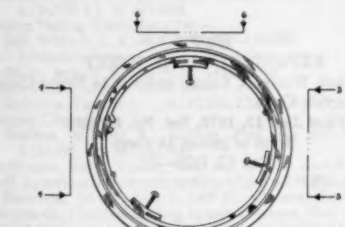
250,966
TOY HELICOPTER
Frank W. Spore, 13074 Gladstone St., Sylmar, Calif. 91342
Filed Dec. 27, 1976, Ser. No. 754,637
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 KK

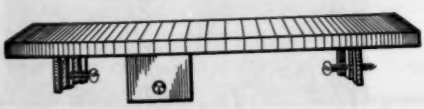


250,967
SIMULATIVE TOY VEHICLE
Wayne A. Effort, 79 College Ave., North Tarrytown, N.Y. 10591
Filed Apr. 13, 1977, Ser. No. 787,048
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AM



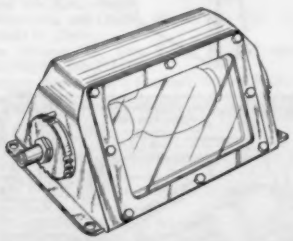
250,968
RING FOR LIGHTING FIXTURE
H. E. Buddy Combest, 3311 Bounty Cir., Huntington Beach, Calif. 92649
Filed Mar. 4, 1977, Ser. No. 774,288
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—7 A



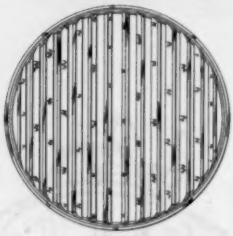


250,969
COMBINED AQUARIUM AND LIGHT FIXTURE
John E. Hackenberg, 12222 194th St., Artesia, Calif. 90701
Filed Feb. 17, 1977, Ser. No. 769,769
Term of patent 14 years
Int. Cl. D26—*05;* D30—*02*
U.S. Cl. D48—20 D

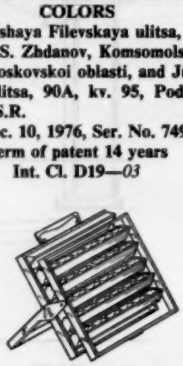
250,970
MINE MACHINE LIGHT
H. P. McJunkin, Jr., Charleston, W. Va., and Randolph E. Slone, Big Stone Gap, Va., assignors to McJunkin Corporation
Filed May 25, 1977, Ser. No. 800,436
Term of patent 14 years
Int. Cl. D26—*05, 03*
U.S. Cl. D48—24 B



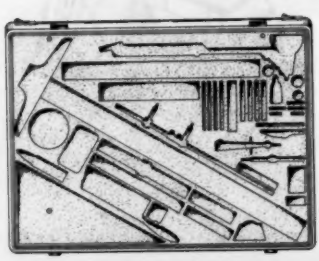
250,971
MUSICAL DRUM SOUND PROJECTOR
George Migirian, 2832 E. Grand Blvd., Detroit, Mich. 48211
Filed Nov. 8, 1976, Ser. No. 739,568
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22



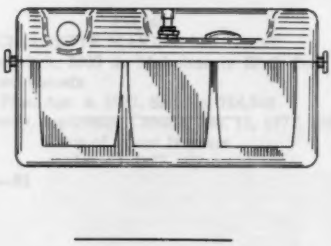
250,972
COMBINED CASSETTE AND PALETTE FOR WATER COLORS
Viktor P. Rodin, Bolshaya Filevskaya ulitsa, 41, korpus 2, kv. 31, Moscow; Petr S. Zhdanov, Komsomolskaya ulitsa, 90A, kv. 74, Podolsk Moskovskoi oblasti, and Jury I. Prokhorov, Komsomolskaya ulitsa, 90A, kv. 95, Podolsk Moskovskoi oblasti, all of U.S.S.R.
Filed Dec. 10, 1976, Ser. No. 749,526
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D87—1 R



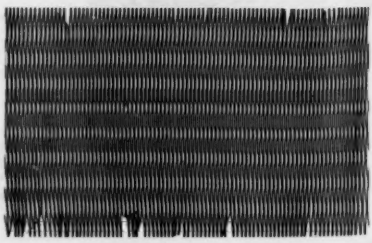
250,973
COMBINED DRAWING BOARD AND INSTRUMENT CARRYING CASE
James D. Ramsey, 616 N. Flores, Los Angeles, Calif. 90040
Filed Jul. 2, 1975, Ser. No. 592,466
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



250,974
CARRIER FOR A CITIZEN'S BAND RADIO UNIT OR THE LIKE
Donald J. Donley, Denver, and Richard E. Watson, Evergreen, both of Colo., assignors to Kendon Manufacturing Company, Inc., Arvada, Colo.
Filed Jun. 6, 1977, Ser. No. 804,107
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



250,975
EXPANDED METAL SHEET
Peter Felsenthal, Westport, Conn., assignor to Exmet Corporation, Bridgeport, Conn.
Filed Jan. 13, 1978, Ser. No. 869,080
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D92—26



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TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF JANUARY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. L. Korr Associates, Inc.: *See*—
Korr, Abraham L., 4,136,674, Cl. 126-271.000.

Ab Kabi: *See*—
Af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,137,225, Cl. 260-112.50R.

AB Volvo Penta: *See*—
Borgersen, Kjell I., 4,136,577, Cl. 74-479.000.

Abbott Laboratories: *See*—
Paris, Gerald Y.; Cimon, Denis G.; and Garmaise, David L., 4,137,317, Cl. 424-256.000.
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Abercrombie, James C.; Pinchin, James D.; and Van Loon, Jack J., to Abercrombie, James Carman; and Pinchin, James Davis. Apparatus for manufacturing concrete building sections. 4,136,849, Cl. 249-18.000.

Abercrombie, James Carman: *See*—
Abercrombie, James C.; Pinchin, James D.; and Van Loon, Jack J., 4,136,849, Cl. 249-18.000.

Abraham, Bruce C.; Emery, Loring D., Jr.; Griesemer, Harold A.; and Stroup, Robert H., to Western Electric Company, Inc. Methods of and apparatus for orienting electrically asymmetrical devices with magnetic handling. 4,136,765, Cl. 198-381.000.

Abrams, D. David, to Mego Corp. Stuffed doll with bendable framework and method of making framework. 4,136,484, Cl. 46-160.000.

ACF Industries, Incorporated: *See*—
Bond, John A., 4,136,710, Cl. 137-375.000.

Acholonu, Kenny U.: *See*—
Panzer, Hans P.; and Acholonu, Kenny U., 4,137,415, Cl. 548-347.000.
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Blanpain, Jacques; and Delehouzee, Leon, 4,137,446, Cl. 219-145.220.

Acket, Gerard A., to U.S. Philips Corporation. Method of manufacturing a semiconductor device. 4,137,122, Cl. 156-601.000.

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Haas, Steven L.; Fonteneau, Norman O.; Sullivan, Paul F.; Hottel, Hoyt C., Jr.; Brown, Robert A.; Gobush, William; Jepson, John W.; and Lynch, Francis deS., 4,137,566, Cl. 364-410.000.

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Adams, James E.; Haas, Werner E. L.; and Dir, Gary A., to Xerox Corporation. Liquid crystal alignment film birefringence compensation. 4,136,933, Cl. 350-341.000.

Adrian, Paul A.: *See*—
Lenker, Don H.; Nascimento, Dennis F.; and Adrian, Paul A., 4,136,509, Cl. 56-327.00R.

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Bull, William T., 4,136,810, Cl. 227-120.000.

AEG-Telefunken-Societa Italiana per Azioni: *See*—
Bosco, Angelo, 4,136,838, Cl. 242-56.00R.

Aerojet-General Corporation: *See*—
Bornstein, Lawrence J., 4,137,286, Cl. 264-3.00R.

Aeroquip Corporation: *See*—
Rodman, Michael R.; Holmes, Paul M.; and Habib, Joseph, 4,136,896, Cl. 285-341.000.

Aeschlimann, Heinz; Nunlist, Rene; and Stocker, Rudolf, to Kern & Co. AG. Apparatus for correcting theodolites. 4,136,955, Cl. 356-152.000.

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Holmqvist, Goran; Molander, Bo; and Wicklund, Jan, 4,136,721, Cl. 141-11.000.

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Komamiya, Yasuo; Tateno, Hiroshi; Kataoka, Shoei; and Mititada, Morisue, 4,137,569, Cl. 364-784.000.

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Walter, Karl, 4,136,839, Cl. 242-71.100.

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Verlinden, Willy G.; Gilliams, Yvan K.; and Stievenart, Emile F., 4,137,340, Cl. 427-16.000.

Aguet, Emile, to Sulzer Brothers Limited. Waste heat steam generator. 4,136,643, Cl. 122-7.00B.

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Ishikawa, Kazuo, 4,136,584, Cl. 74-867.000.
Nogami, Tomoyuki; and Tsubouchi, Kaoru, 4,136,712, Cl. 137-558.000.

Akao, Masatake; Yokose, Yoshikazu; Yamashita, Kazuo; and Shibano, Takashi, to Matsushita Electric Industrial Co., Ltd. Synthetic resin packed coil assembly. 4,137,515, Cl. 336-84.00C.

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Couch, Thomas W.; Harvey, James A.; and Tummers, Gerardus L. J., 4,137,049, Cl. 422-56.000.

Albert, Kenneth J., to Inventor's Inc. Decanter. 4,136,799, Cl. 220-415.000.

Albrecht, Drew E.; Doran, Samuel K.; Michail, Michel S.; and Yourke, Hannon S., to International Business Machines Corporation. Method and apparatus for applying focus correction in E-beam system. 4,137,459, Cl. 250-492.00A.

Alf Cooke Bag Co. Ltd.: *See*—
Austin, Alan, 4,136,471, Cl. 40-159.000.

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Holm, Leif G.; and Korremann-Nielsen, Birgitte N., 4,137,335, Cl. 426-417.000.
Sjoholm, Claes B.; and Martensson, Karl J. G., 4,136,886, Cl. 277-24.000.

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Garcea, Giampaolo, 4,137,517, Cl. 338-118.000.

Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; Kieslich, Klaus; and Wiechert, Rudolf, to Hoffmann-La Roche Inc. D-homosteroids. 4,137,269, Cl. 260-586.00E.

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Bell, Frederick K.; Deis, Jerome E.; and Allen, Paul E., 4,136,458, Cl. 33-174.00L.

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Prevorsek, Dusan C.; and Segal, Leon, 4,137,218, Cl. 528-126.000.
Ray, Ranjan; Tanner, Lee E.; and Cline, Carl F., 4,137,075, Cl. 75-174.000.

Allis-Chalmers Canada, Limited: *See*—
Yateman, Earl W.; and Sanderson, Gerald D., 4,136,768, Cl. 198-830.000.

Allis-Chalmers Corporation: *See*—
Coleman, Martin W.; and Northup, Edwin M., 4,136,508, Cl. 56-208.000.

Alpana Aluminum Products, Inc.: *See*—
Hetman, Frank W.; Rakouska, Kenneth D.; and Baron, Robert N., 4,136,419, Cl. 15-302.000.

Alpex Computer Corporation: *See*—
Sessa, Conio, 4,137,556, Cl. 361-91.000.

Alpha Nova Development Corp.: *See*—
Storms, William L., 4,136,805, Cl. 224-28.00R.

Alps Electric Co., Ltd.: *See*—
Sato, Hidetoshi; and Ohkita, Masao, 4,137,438, Cl. 200-153.00H.

Alston, Robert B.: *See*—
Haynes, Stewart, Jr.; Lim, Frank H.; and Alston, Robert B., 4,136,738, Cl. 166-273.000.

Althoff, Jurgen; Jager, Kurt; Lommel, Heinz; Moller, Manfred; and Potzschke, Manfred, to Metallgesellschaft Aktiengesellschaft. Aluminum alloy products of high corrosion resistance and deformability. 4,137,102, Cl. 148-31.500.

Alvarado Orthopedic Research, Inc.: *See*—
Petersen, Thomas D., 4,136,858, Cl. 269-328.000.

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Bucksbaum, Arnold M., 4,137,441, Cl. 219-10.55D.

Amano, Masahiro: *See*—
Koike, Takashi; and Amano, Masahiro, 4,137,046, Cl. 8-192.000.

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Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,136,893, Cl. 280-678.000.

American Cyanamid Company: *See*—
Coscia, Anthony T.; and O'Connor, Michael N. D., 4,137,164, Cl. 210-54.000.
Coscia, Anthony T.; and O'Connor, Michael N. D., 4,137,165, Cl. 210-54.000.
Panzer, Hans P.; and Acholonu, Kenny U., 4,137,415, Cl. 548-347.000.
Panzer, Hans P.; and Acholonu, Kenny U., 4,137,416, Cl. 548-353.000.
Wang, Guang T., 4,137,310, Cl. 424-204.000.
American & Efird Thread Mills, Inc.: *See*—
Livingstone, Stanley; and Broome, Gordon H., 4,136,842, Cl. 242-118.110.
American Home Products Corporation: *See*—
Hon, Edward H., 4,136,681, Cl. 128-2.00R.
Mack, Frank J.; and Demkowicz, Michael P., 4,136,825, Cl. 239-44.000.
Sellstedt, John H.; Guinosso, Charles J.; Shriver, David A.; and Klaubert, Dieter H., 4,137,325, Cl. 424-311.000.
American Hospital Supply Corporation: *See*—
Jones, Eugene C., 4,137,117, Cl. 156-294.000.
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Watts, Ridley, Jr., 4,136,777, Cl. 206-469.000.
Amin, Ramesh G.: *See*—
Torre, Alton J.; Retsky, Michael W.; Gioia, Norman F.; and Amin, Ramesh G., 4,137,480, Cl. 313-481.000.
AMP Incorporated: *See*—
Brandewie, Joseph E.; Folk, Kenneth F.; and Ross, Milton D., 4,136,440, Cl. 29-628.000.
Grubb, Daniel B., 4,136,445, Cl. 30-90.100.
Amsted Industries Incorporated: *See*—
Bos, John A., 4,137,175, Cl. 210-351.000.
Anders, Dale F.: *See*—
Berenschot, Donald J.; Anders, Dale F.; and Hawker, Fred D., 4,137,205, Cl. 260-29.4UA.
Anderson, Donald L.; and Cherry, Isaac R., to Del Mar Avionics. Method and apparatus for vector analysis of ECG arrhythmias. 4,136,690, Cl. 128-2.06A.
Anderson, Joseph W.; Guile, Donald L.; and Smith, Roy E., to Corning Glass Works. Oxide depositing ribbon burner. 4,136,828, Cl. 239-422.000.
Anderson, Steven G.: *See*—
Barton, Steven A.; and Anderson, Steven G., 4,136,701, Cl. 128-418.000.
Andree, George C. Magnifying hand tool with self-containing illuminating means. 4,137,561, Cl. 362-119.000.
Andrew, Clifford G.; and Andrew, Louise B. Intern board game. 4,136,879, Cl. 273-243.000.
Andrew, Louise B.: *See*—
Andrew, Clifford G.; and Andrew, Louise B., 4,136,879, Cl. 273-243.000.
Angelbeck, Peter: *See*—
Graves, Kenneth E.; and Angelbeck, Peter, 4,137,025, Cl. 425-71.000.
Angelo, Raymond W.; Armstrong, Edward J.; and Bock, Robert, to International Business Machines Corporation. Wire coating solution. 4,137,211, Cl. 260-31.4EP.
Anselrode, Lodewijk: *See*—
Vertegaal, Jacobus-Gerardus; and Anselrode, Lodewijk, 4,137,142, Cl. 204-192.00P.
Anson, James H.; and Steffen, David E., to Dickey-john Corporation. Calibrated tuneable monitor. 4,137,529, Cl. 340-684.000.
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Ansul Company, The: *See*—
Plog, Richard J., 4,137,467, Cl. 307-264.000.
Antkowiak, Thomas A.: *See*—
Prichard, Mark S.; Hilton, Ashley S.; Stayer, Mark L., Jr.; and Antkowiak, Thomas A., 4,137,330, Cl. 423-300.000.
Antonious, Anthony J. Golf club alignment system. 4,136,877, Cl. 273-164.000.
Antos, George J., to UOP Inc. Hydrocarbon conversion with an attenuated superactive multimetallic catalytic composite. 4,137,153, Cl. 208-139.000.
Applegate, Merlin J.: *See*—
Brouwer, Floyd; Helms, Roger E.; Litty, Fred D.; and Applegate, Merlin J., 4,136,962, Cl. 356-248.000.
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Araki, Yasuhiko: *See*—
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Archer, Keith: *See*—
Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, 4,137,297, Cl. 423-561.00R.
Arcilesi, Donald A., to M&T Chemicals Inc. Acid zinc electroplating process and composition. 4,137,133, Cl. 204-55.00R.
Areaux, Larry D.: *See*—
Dudley, Robert H.; and Areaux, Larry D., 4,137,176, Cl. 210-375.000.
Arimura, Ichiro: *See*—
Yamamitsu, Chojuro; Arimura, Ichiro; Kitamura, Sadafumi; and Meki, Norio, 4,137,547, Cl. 358-8.000.
Arluck, Elmer M., to yardney Company. Orthopedic device. 4,136,686, Cl. 128-90.000.
Armco Steel Corporation: *See*—
Graff, Hart F.; Kohler, John B.; Parks, Noel W.; Pierson, Marvin B.; Schnedler, Paul E.; and Strait, Richard E., 4,137,347, Cl. 427-349.000.
Armour Pharmaceutical Company: *See*—
Rubino, Andrew M.; and Margres, John J., 4,137,306, Cl. 424-68.000.
Armstrong, Edward J.: *See*—
Angelo, Raymond W.; Armstrong, Edward J.; and Bock, Robert, 4,137,211, Cl. 260-31.4EP.
Arneklev, Duane R.; and Baker, Don R., to Stauffer Chemical Company. Sulfide herbicide antidote compositions and method of use. 4,137,069, Cl. 71-98.000.
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Arnold, Dan M.: *See*—
Paap, Hans J.; Arnold, Dan M.; and Scott, Hubert D., 4,137,452, Cl. 250-270.000.
Arnould, Marcel; Struillou, Roger; and Roger, Jack, to Association pour la Recherche et le Developpment des Methodes et Processus Industriels (A.R.M.I.N.E.S.). Process for producing hydraulic binders and binders obtained. 4,137,089, Cl. 106-100.000.
ARP Instruments, Inc.: *See*—
Gillette, Timothy C., 4,136,595, Cl. 84-1.010.
Arthur G. McKee & Company: *See*—
Berzins, Andrejs, 4,136,790, Cl. 214-36.000.
Asahi Denka Kogyo Kabushiki Kaisha: *See*—
Ueda, Tadao; Nagaya, Teruo; and Kawada, Koji, 4,137,136, Cl. 204-98.000.
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Kudo, Shiro; Ishino, Keizo; and Takashima, Yoshinori, 4,137,339, Cl. 426-634.000.
Asselman, George A. A.; Green, David B.; Castelijns, Adrianus P. J.; Naastepad, Pieter A.; and de Ruiter, Jacob W., to U.S. Philips Corporation. Heating device. 4,136,733, Cl. 165-32.000.
Associated Paper Industries Limited: *See*—
Singh, Tej K., 4,137,110, Cl. 156-62.200.
Association pour la Recherche et le Developpment des Methodes et Processus Industriels (A.R.M.I.N.E.S.): *See*—
Arnould, Marcel; Struillou, Roger; and Roger, Jack, 4,137,089, Cl. 106-100.000.
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Johansson, Folke L.; and Svenning, B. F. Staffan, 4,136,853, Cl. 251-282.000.
Attridge, Russell G., Jr.: *See*—
Demaray, Merlin E.; and Attridge, Russell G., Jr., 4,136,732, Cl. 165-16.000.
Audas, Francis G. Padding apparatus for goods in web-form. 4,136,535, Cl. 68-5.00E.
Audeh, Costandi A., to Mobil Oil Corporation. Process for the removal of nitrogen compounds from various organic media. 4,137,154, Cl. 208-254.00R.
Auracher, Franz; and Kersten, Ralf, to Siemens Aktiengesellschaft. Method for the production of a light conductor structure with interlying electrodes. 4,136,439, Cl. 29-624.000.
Aurell, Leif E.: *See*—
Af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,137,225, Cl. 260-112.50R.
Ausherman, Harry S. Water activated stop for spinners. 4,136,826, Cl. 239-212.000.
Austel, Volkhard: *See*—
Eberlein, Wolfgang; Heider, Joachim; Austel, Volkhard; Dammgen, Jurgen; and Kadatz, Rudolf, 4,137,318, Cl. 424-258.000.
Austin, Alan, to Alf Cooke Bag Co. Ltd. Document carrier. 4,136,471, Cl. 40-159.000.
Australasian Training Aids Pty. Ltd.: *See*—
Bowyer, William H., 4,136,873, Cl. 273-102.00B.
Autelca AG: *See*—
Wuthrich, Werner, 4,136,614, Cl. 101-274.000.
Avco Corporation: *See*—
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Avtex Fibers Inc.: *See*—
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B & G Hydraulics Limited: *See*—
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B & K Machinery International Ltd.: *See*—
Ellison, Kenneth; and Whike, Alan S., 4,136,636, Cl. 118-68.000.
Bacha, John D.; Onopchenko, Anatoli; and Schulz, Johann G. D., to

Gulf Research & Development Company. Process for preparing 4-nitro-o-phthalic acid. 4,137,419, Cl. 562-408.000.

Badger Company, Inc., The: *See*—
Miserlis, Constantine D.; and Lewis, Peter J., 4,137,387, Cl. 526-62.000.

Bailey, Dale A.: *See*—
Nees, John; and Bailey, Dale A., 4,137,378, Cl. 429-245.000.

Bailey, William L.; Coleman, Michael G.; Harris, Cynthia B.; and Lesk, Israel A., to Motorola, Inc. Texture etching of silicon: method. 4,137,123, Cl. 156-647.000.

Bak, Eugene; and Collins, Albert V., to Mooney Chemicals, Inc. Elastomers with improved metal adhesion. 4,137,359, Cl. 428-295.000.

Baker, Don R.: *See*—
Arneklev, Duane R.; and Baker, Don R., 4,137,069, Cl. 71-98.000.

Baker, Donald A.: *See*—
Lemieux, Raymond U.; Bundle, David R.; and Baker, Donald A., 4,137,401, Cl. 536-116.000.

Baker Perkins Inc.: *See*—
Todd, David B., 4,136,968, Cl. 366-85.000.

Baker, Richard H., to Exxon Research & Engineering Co. Waveform synthesizer. 4,137,570, Cl. 363-43.000.

Bakker, Nicolaas, to Chevron Research Company. Overbased sulfonates. 4,137,184, Cl. 252-33.000.

Ball, George L., III; Werkmeister, Dennis W.; and Salyer, Ival O., to Monsanto Research Corporation. Transparent laminate and adhesive film. 4,137,364, Cl. 428-412.000.

Banthin, Clifford R.: *See*—
Hurley, John F.; and Banthin, Clifford R., 4,136,518, Cl. 60-264.000.

Baranyi, Anthony J.: *See*—
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Barbashin, Oleg A.; Okunev, Alexandr A.; Mikhailov, Sergei K.; Mochalov, Lev E.; Orlov, Lev P.; Shenderov, Lev B.; Shelepov, Nikolai S.; Dubodin, Vissarion M.; Vladimirov, Alexandr S.; and Gorynin, Igor V. Airtight metal melting furnace. 4,137,422, Cl. 13-9.00R.

Barbee, Boyd D. Carburetor. 4,137,284, Cl. 261-44.00B.

Barbin, Robert L.: *See*—
Kelly, William R.; and Barbin, Robert L., 4,137,548, Cl. 358-10.000.

Barclay, Andrew C.: *See*—
Potter, William D.; Barclay, Andrew C.; Dunning, Reginald; and Parry, Richard J., 4,137,086, Cl. 106-52.000.

Barkan, Philip; and Barton, Robert S., to General Electric Company. Means for manually slow-closing a circuit breaker that has a spring-actuated operating device. 4,137,436, Cl. 200-153.0SC.

Barker, Edison D.; and Cook, John A., to General Motors Corporation. High speed coolant feeding gun drill and cutting head section therefor. 4,137,002, Cl. 408-59.000.

Barnes, Clive: *See*—
Ward, John J. B.; and Barnes, Clive, 4,137,132, Cl. 204-38.00R.

Barnish, Ian T.: *See*—
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Baron, Robert N.: *See*—
Hetman, Frank W.; Rakouska, Kenneth D.; and Baron, Robert N., 4,136,419, Cl. 15-302.000.

Bartlebaugh, Harry R.: *See*—
Kinzler, Raymond C.; and Bartlebaugh, Harry R., 4,136,804, Cl. 222-547.000.

Bartley, George S.; and Brunner, Stanley N., to Exxon Research & Engineering Co. Stepper motor with analog positioning. 4,137,491, Cl. 318-685.000.

Barton, Robert S.: *See*—
Barkan, Philip; and Barton, Robert S., 4,137,436, Cl. 200-153.0SC.

Barton, Steven A.; and Anderson, Steven G. Retractable stimulation electrode apparatus. 4,136,701, Cl. 128-418.000.

Barz, Benno. Quick change picture frame. 4,136,470, Cl. 40-152.000.

BASF Aktiengesellschaft: *See*—
Kempter, Fritz E.; Gulbins, Erich; Haag, Armin; and Kroker, Ruprecht, 4,137,213, Cl. 260-39.00P.
Koenig, Karl-Heinz; Reitel, Christian; and Mangold, Dietrich, 4,137,261, Cl. 260-544.00C.
Theysohn, Rainer; Penzien, Klaus; Seydl, Wolfgang; Wurmb, Rolf; Reimann, Horst; Cordes, Claus; and Sterzel, Hans-Josef, 4,137,212, Cl. 260-37.00N.

BASF Wyandotte Corporation: *See*—
Louvar, Joseph F.; Capraro, Michael A.; and Herring, William M., 4,137,396, Cl. 536-4.000.
Muzzio, John A., 4,137,398, Cl. 536-4.000.

Basford, John: *See*—
Corbet, John S.; Basford, John; and Hemming, James R., 4,136,625, Cl. 431-336.000.

Bassier, Friedrich-Karl; and Goldschmidt, Klaus, to Ruhrkohle AG; and Steag AG. Process for the disposal of the residue of the exhaust gas washers of furnaces in particular bituminous coal power stations. 4,136,998, Cl. 405-267.000.

Bastian, Jean-Michel, to Sandoz Ltd. Organic compounds. 4,137,323, Cl. 424-275.000.

Basu, Sanat K.: *See*—
Dutta, Sadhan K.; and Basu, Sanat K., 4,137,397, Cl. 536-9.000.

Batcho, Andrew D.; and Leimgruber, Willy, to Hoffmann-La Roche Inc. Synthesis of tryptophans. 4,137,404, Cl. 542-442.000.

Bates, Charles A. Cord take-up reel for an electric lawn mower. 4,136,840, Cl. 242-86.50R.

Batt, Colin B.; Kucharska, Helena Z.; and Jansen, Arie, to Reichhold Chemicals Limited. Radiation curable compositions. 4,137,138, Cl. 204-159.180.

Battigelli, Jean A.: *See*—
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,137,059, Cl. 65-5.000.

Bauer, Alajos Z.: *See*—
Lytle, Thomas G.; and Bauer, Alajos Z., 4,136,549, Cl. 72-453.160.

Bauer, Wolfgang; and Ribka, Joachim, to Cassella Aktiengesellschaft. Water-soluble, copper containing trisazo compounds having a 2-(4'phenylene)-benzimidazoyl-(5 or 6),-benzoxazolyl-(5), or -benzthiazolyl-(5) component. 4,137,228, Cl. 260-146.00R.

Bauerschmidt, Walter, to Eberspacher, J. Absorption muffler construction. 4,136,757, Cl. 181-256.000.

Bausch & Lomb Incorporated: *See*—
Wrue, Richard J., 4,136,466, Cl. 35-17.000.

Baxter Travenol Laboratories, Inc.: *See*—
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Ebling, Wendell V.; Lamadrid, Rene G.; and Phillips, Earl G., 4,137,160, Cl. 210-22.00A.
Kuehn, Robert L., 4,136,694, Cl. 128-214.00D.

Bayer Aktiengesellschaft: *See*—
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Grigat, Ernst; and Hetzel, Hartmut, 4,136,967, Cl. 366-82.000.
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,137,219, Cl. 528-177.000.
Immel, Otto; Kaiser, Bernd-Ulrich; Schwarz, Hans-Helmut; and Starke, Klaus, 4,137,263, Cl. 260-566.00A.
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rold; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,137,242, Cl. 260-348.250.
Reischl, Artur, 4,137,360, Cl. 428-310.000.
Werner, Friedrich; Putter, Rolf; and Wenzl, Peter, 4,137,238, Cl. 260-315.000.
Wingler, Frank; Pedain, Josef; and Uerdingen, Walter, 4,137,389, Cl. 526-86.000.

BBA Group Limited: *See*—
Stonebridge, Arthur L., 4,137,352, Cl. 428-102.000.

BBC Brown, Boveri & Company, Limited: *See*—
Osman, Maged A.; and Scheffer, Terry J., 4,137,193, Cl. 252-299.000.

Beach, Janet. Method of admitting solutions to medical drainage or irrigation conduits. 4,136,678, Cl. 128-1.00R.

Beaman, Norman V., to Robertshaw Controls Company. Instrument probe assembly having continuous probe insulation. 4,137,558, Cl. 361-284.000.

Beatty Machine & Manufacturing Co.: *See*—
Beatty, William C., 4,136,592, Cl. 83-516.000.

Beatty, William C., to Beatty Machine & Manufacturing Co. Apparatus for one-pass punching of beams. 4,136,592, Cl. 83-516.000.

Bechard, James R.: *See*—
Palmer, Howard J.; and Bechard, James R., 4,136,660, Cl. 123-198.0DC.

Beck, Harold D.; and Kolthoff, C. Paul, Jr., to International Harvester Company. Heat exchange apparatus including a toroidal-type radiator. 4,136,735, Cl. 165-125.000.

Becke, Hans W., to RCA Corporation. Gate turn-off thyristor with anode rectifying contact to non-regenerative section. 4,137,545, Cl. 357-39.000.

Becker, John H., to K B Southern, Inc. Composite horizontally split casing. 4,137,006, Cl. 415-201.000.

Beckman Instruments, Inc.: *See*—
Klein, Gerald L.; and Meyer, Richard C., 4,136,953, Cl. 356-339.000.

Becton, Dickinson and Company: *See*—
Percarpio, Edward P., 4,136,794, Cl. 215-247.000.

Becwar, Andrew J.: *See*—
Schlom, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J., 4,137,058, Cl. 62-121.000.

Beehler, Vernon D.: *See*—
Sawyer, Harold T., 4,137,159, Cl. 210-19.000.

Belanger, William J., to Celanese Polymer Specialties Company. Cathodic electrocoating. 4,137,140, Cl. 204-181.00C.

Bell, Cecil R., Jr.; and Sizemore, Walter R., to Hanes Corporation. Panty hose testing apparatus and method. 4,136,557, Cl. 73-816.000.

Bell, Frederick K.; Deis, Jerome E.; and Allen, Paul E., to Bendix Corporation, The. Bi-axial probe. 4,136,458, Cl. 33-174.00L.

Bell Telephone Laboratories, Incorporated: *See*—
Bosch, Fridolin L., 4,137,468, Cl. 307-268.000.
Federico, Joseph; Knight, Stephen; and Waaben, Sigurd G., 4,137,428, Cl. 179-1.0SW.
Jones, Joseph S., 4,137,511, Cl. 333-71.000.
Logan, Ralph A.; and Merz, James L., 4,136,928, Cl. 350-96.110.
Thibault, Louis R.; and Yau, Leopoldo D., 4,136,434, Cl. 29-571.000.

Bellinger, James E., Jr.; and MacNeill, John H., to Optical Business Machines, Inc. High speed electromagnetic printing head. 4,136,978, Cl. 400-124.000.

Bellis, John, to British Steel Corporation. Joining metals. 4,136,812, Cl. 228-175.000.

Belokin, Paul, Jr. Illuminated overhead advertising display. 4,136,474, Cl. 40-559.000.

Bemis Company, Inc.: *See*—
Connolly, Hugh R., 4,136,501, Cl. 53-461.000.

Bendix Corporation, The: *See*—
Bell, Frederick K.; Deis, Jerome E.; and Allen, Paul E., 4,136,458, Cl. 33-174.00L.

Woodruff, Frank, 4,137,013, Cl. 417-222.000.

Beneking, Heinz, to Licentia Patent Verwaltungs GmbH. Light detector arrangement. 4,137,543, Cl. 357-30.000.

Berecek, Joseph P.: *See—*
Musselman, Lawrence L.; Harbottle, William E.; and Berecek, Joseph P., 4,136,916, Cl. 308-213.000.

Berenschot, Donald J.; Anders, Dale F.; and Hawker, Fred D., to DeSoto, Inc. Aqueous emulsion thermosetting coating compositions. 4,137,205, Cl. 260-29.4UA.

Berger, Alfred, to Ciba-Geigy Corporation. Anionic araliphatic compounds. 4,137,251, Cl. 260-458.00C.

Berger, Jenson & Nicholson Limited: *See—*
Elliott, William T., 4,137,208, Cl. 260-29.6RB.

Berluti, Vincent, Jr.: *See—*
Fitzsimmons, Thomas W.; Berluti, Vincent, Jr.; Wagner, Howard G.; and Shapiro, Jonathan S., 4,137,460, Cl. 250-511.000.

Berney, Remy: *See—*
Briand, Pierre; and Berney, Remy, 4,136,451, Cl. 33-141.00E.

Bernier, Lornie J.; and Das, Tapan K., to Textron, Inc. Method of producing a dyeable coating on a metal article. 4,137,043, Cl. 8-4.000.

Berthold, Richard; and Troxler, Franz, to Sandoz Ltd. 3-Piperidino-2-hydroxypropoxy substituted-2-indolinones. 4,137,331, Cl. 424-267.000.

Berzins, Andrejs, to Arthur G. McKee & Company. Charging apparatus with removable bell. 4,136,790, Cl. 214-36.000.

Bethlehem Steel Corporation: *See—*
Sunnergren, Carl E.; Simms, John K.; and Brinker, Dale W., 4,136,965, Cl. 366-25.000.

Bianco, Romolo P. Expandable annular cam-type locking device for a shaft. 4,136,989, Cl. 403-261.000.

Bieringer, Robert J., to Owens-Illinois, Inc. Ampule score line detection. 4,136,779, Cl. 209-524.000.

Billeruds Aktiebolag: *See—*
Johansson, Erik V.; and Kullander, Mats O., 4,136,635, Cl. 118-50.000.

Billings, David L.: *See—*
Wright, Lonnie C.; and Billings, David L., 4,137,514, Cl. 335-220.000.

Bishop, Robert C.: *See—*
Shanbrom, Edward; and Bishop, Robert C., 4,137,223, Cl. 260-112.00B.

Bittner, Charles W.: *See—*
Shacklett, James H., Jr.; and Bittner, Charles W., 4,136,860, Cl. 270-61.00R.

Bjorklund, Bradford L., to UOP Inc. Fractionation process. 4,137,129, Cl. 203-26.000.

Blanchart, Alain P. O.; Spaepen, Gustaaf J. F.; and De Brandt, Constantine W. M. V. A., to Electrochemische Energieconversie N.V. Electrochemical zinc-oxygen cell. 4,137,371, Cl. 429-29.000.

Blanpain, Jacques; and Delehouzee, Leon, to Acieries Reunies de Burbach-eich-Dudelange S.S.Arbed. Welding wire constituted by a core of welding powder enclosed by a mantle of metal and a method of producing the welding wire. 4,137,446, Cl. 219-145.220.

Blaskiewicz, Arthur A.; and Mitchell, Julian M., to Uniroyal, Inc. Painted exterior automotive body parts. 4,137,350, Cl. 428-31.000.

Blasko, John E.; Boberski, William G.; and Seiner, Jerome A., to PPG Industries, Inc. Curable compositions comprising aqueous solutions of water-soluble silicates and water-soluble latent insolubilizing agents. 4,137,087, Cl. 106-84.000.

Blockburger, James E. Underwater release mechanism. 4,136,415, Cl. 9-8.00R.

Blockwick, Thomas N.: *See—*
Day, John T.; Herder, Robert O.; Blockwick, Thomas N.; Brockman, Dan B.; Sharpe, John F.; and Hildebrand, Richard W., 4,136,632, Cl. 114-220.000.

BNF Metals Technology Centre: *See—*
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Board of Regents University of Nevada System: *See—*
Telford, James W., 4,137,009, Cl. 416-24.000.

Boaz, Premakaran T., to Ford Motor Company. Electric heater plate. 4,137,447, Cl. 219-522.000.

Boberski, William G.: *See—*
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Bock, Jan: *See—*
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Bock, Robert: *See—*
Angelo, Raymond W.; Armstrong, Edward J.; and Bock, Robert, 4,137,211, Cl. 260-31.4EP.

Boeck, Joachim; Dunker, Peter; Fryen, Jurgen; Neumann, Dietrich; Pattberg, Georg; and Wieseke, Udo, to Vereinigte Flugtechnische Werke-Fokker GmbH. Data acquisition from multiple sources. 4,137,562, Cl. 364-200.000.

Boehringer Ingelheim GmbH: *See—*
Eberlein, Wolfgang; Heider, Joachim; Austel, Volkhard; Dammgen, Jurgen; and Kadatz, Rudolf, 4,137,318, Cl. 424-258.000.
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; Haarmann, Walter; and Engelhardt, Gunther, 4,137,313, Cl. 424-246.000.

Boeing Commercial Airplane Company: *See—*
Brault, Paul C., 4,136,846, Cl. 244-123.000.
Kim, Duk H., 4,137,047, Cl. 23-230.00C.

Bogan, Richard T.: *See—*
Kuo, Chung-Ming; Wang, Richard H. S.; and Bogan, Richard T., 4,137,201, Cl. 260-13.000.

Boltswitch, Inc.: *See—*
Erickson, James A.; and Erickson, John W., 4,137,433, Cl. 200-50.00A.

Bond, John A., to ACF Industries, Incorporated. Floating seat structure for gate valves. 4,136,710, Cl. 137-375.000.

Boor, Francis H., to Fairfield Manufacturing Co., Inc. Shaft and bore combination. 4,136,582, Cl. 74-710.000.

Booth, Darcy L. Container for artist's crayons. 4,136,773, Cl. 206-214.000.

Borg-Warner Corporation: *See—*
Wentworth, Robert S., Jr., 4,136,887, Cl. 277-43.000.

Borgersen, Kjell I., to AB Volvo Penta. Device for connecting either one of two alternative operating members with an operated member. 4,136,577, Cl. 74-479.000.

Bornstein, Lawrence J., to Aerojet-General Corporation. Method of making dual-thrust rocket motor. 4,137,286, Cl. 264-3.00R.

Bos, John A., to Amsted Industries Incorporated. Method and means for filtering liquids. 4,137,175, Cl. 210-351.000.

Bosch, Fridolin L., to Bell Telephone Laboratories, Incorporated. Method and apparatus for correcting pulse timing pattern. 4,137,468, Cl. 307-268.000.

Bosco, Angelo, to AEG-Telefunken-Societa Italiana per Azioni. Machine for winding magnetic tapes onto cassettes. 4,136,838, Cl. 242-56.00R.

Bouvier, Ronald O. Skip rope. 4,136,866, Cl. 272-75.000.

Bowie, William R., Jr.; and Sampson, George B., to United States of America, Health, Education and Welfare. Transport device for invalids. 4,136,888, Cl. 280-5.220.

Bowyer, William H., to Australasian Training Aids Pty. Ltd. Targets and materials therefor. 4,136,873, Cl. 273-102.00B.

Boyer, Jean-Jacques. Railroad lifting device for ballast cleaning and levelling machines. 4,136,618, Cl. 104-7.00R.

Braden, Rudolf; and Findeisen, Kurt, to Bayer Aktiengesellschaft. Process for the preparation of substituted chloropyrimidines. 4,137,412, Cl. 544-334.000.

Bradford, Rolland H.; Laylander, Paul V.; and Baranyi, Anthony J., to NRG Incorporated. Supporting structure for containers used in storing liquefied gas. 4,136,493, Cl. 52-169.700.

Bradshaw, Robert S.: *See—*
Hunter, James R.; Lazzarotti, Sebastian J.; and Bradshaw, Robert S., 4,136,780, Cl. 209-539.000.

Braizler, Karl; and Doerges, Alexander, to Metallgesellschaft Aktiengesellschaft. Process of scrubbing fuel synthesis gases to remove acid gases and organic sulfur compounds. 4,137,294, Cl. 423-223.000.

Brand, Wilhelm; Dienst, Manfred; Herbert, Adolf; and Henjes, Gunther, to Hermann Berstorff Maschinenbau GmbH. Power branching transmission. 4,136,580, Cl. 74-665.0GA.

Brandes, Walter B., to Baxter Travenol Laboratories, Inc. Device for indexing an array of sample containers. 4,136,429, Cl. 29-235.000.

Brandewie, Joseph E.; Folk, Kenneth F.; and Ross, Milton D., to AMP Incorporated. Electrical harness fabrication method and apparatus. 4,136,440, Cl. 29-628.000.

Brandon, Robert J., Jr., to Rolls-Royce (1971) Limited. Radiography. 4,137,454, Cl. 250-402.000.

Brault, Paul C., to Boeing Commercial Airplane Company. Composite structure. 4,136,846, Cl. 244-123.000.

Brenner, Douglas: *See—*
Makowski, Henry S.; Brenner, Douglas; and Bock, Jan, 4,137,203, Cl. 260-23.50A.

Briand, Pierre; and Berney, Remy, to Francois Golay S.A. Device for measuring distance for a ski. 4,136,451, Cl. 33-141.00E.

Briechle, George T.; Di Domizio, John A.; and Weindling, Frederik, to United Technologies Corporation. Angle/vector processed, phase-accumulated single vector rotation, variable order adaptive MTI processor. 4,137,533, Cl. 343-7.700.

Briggs, Roger L.: *See—*
Moore, Eugene R.; Briggs, Roger L.; McDonald, David C.; and Hoffman, Richard, 4,137,258, Cl. 562-477.000.

Bright, Robert P.: *See—*
Homer, Joseph F.; Glaeser, John L.; and Bright, Robert P., 4,136,633, Cl. 114-264.000.

Brimm, Daniel J., to Chem-tronics, Inc. Chemical milling apparatus. 4,137,118, Cl. 156-345.000.

Brinker, Dale W.: *See—*
Sunnergren, Carl E.; Simms, John K.; and Brinker, Dale W., 4,136,965, Cl. 366-25.000.

British Steel Corporation: *See—*
Bellis, John, 4,136,812, Cl. 228-175.000.

Broadwin, Alan; Weiss, Steven N.; and Enker, Stanley H., to Cavitron Corporation. Neurosonic aspirator. 4,136,700, Cl. 128-305.000.

Broan Manufacturing Co., Inc.: *See—*
Wolbrink, David W., 4,136,606, Cl. 98-33.00A.

Brockman, Dan B.: *See—*
Day, John T.; Herder, Robert O.; Blockwick, Thomas N.; Brockman, Dan B.; Sharpe, John F.; and Hildebrand, Richard W., 4,136,632, Cl. 114-220.000.

Brodsky, Lee D.; Moskowitz, Mark L.; and Moore, Ralph G. D., to GAF Corporation. 3,3-(1,1'-Biphenyl-2,2'-diyl)-1-(4-methylphenyl)-1-triazene. 4,137,226, Cl. 260-140.000.

Brois, Stanley J.: *See—*
Gardiner, John B.; Zielinski, James; Elliott, Robert L.; and Brois, Stanley J., 4,137,185, Cl. 252-33.000.

Brokke, Mervin E.: *See—*
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,137,070, Cl. 71-100.000.

Brooks, Alfred W., to Cannon Limited. Organic material treatment apparatus. 4,137,029, Cl. 425-222.000.

Brooks, Frank E.; and Wunderlich, Guenther C., to Platt Saco Lowell Limited. Builder mechanism for textile machine. 4,136,835, Cl. 242-26.400.

Broome, Gordon H.: *See—*
Livingstone, Stanley; and Broome, Gordon H., 4,136,842, Cl. 242-118.110.

Brouwer, Floyd; Helms, Roger E.; Litty, Fred D.; and Applegate, Merlin J., to Vari-Tech Company. Apparatus for orienting and maintaining the orientation of construction equipment. 4,136,962, Cl. 356-248.000.

Brown, David M. B. Oil detector. 4,137,495, Cl. 324-30.00B.

Brown, Donald P.: *See—*
Cannon, Collins P.; and Brown, Donald P., 4,137,423, Cl. 174-19.000.

Brown, Geoffrey T.; and Case, John R., to Imperial Chemical Industries Limited. Fire-retardant composition. 4,137,199, Cl. 521-138.000.

Brown, Harold, to General Electric Company. Thrust control system for a gas turbine engine. 4,136,517, Cl. 60-223.000.

Brown, Martin L.: *See—*
McCormack, Charles E.; and Brown, Martin L., 4,136,715, Cl. 138-130.000.

Brown, Michael J.; Resnick, Bruce M.; and Woodland, James H. R., to GAF Corporation. 1-(Alkoxyphenyl)-5-(phenyl)biguanide compositions for use as agricultural fungicides. 4,137,332, Cl. 424-326.000.

Brown, Robert A.: *See—*
Haas, Steven L.; Fonteneau, Norman O.; Sullivan, Paul F.; Hottel, Hoyt C., Jr.; Brown, Robert A.; Gobush, William; Jepson, John W.; and Lynch, Francis deS., 4,137,566, Cl. 364-410.000.

Brown & Williamson Tobacco Corporation: *See—*
Tyler, William R., Jr., 4,136,610, Cl. 100-100.000.

Brown, Winthrop K., to Texaco, Inc. Torque meter means. 4,136,559, Cl. 73-136.00A.

Brozoski, Daniel J.; and Pupak, Pupak T., to Cutler-Hammer, Inc. Trigger speed control switch. 4,137,490, Cl. 318-345.00G.

Brucken, Byron L., to General Motors Corporation. Rotary vane variable capacity compressor. 4,137,018, Cl. 417-440.000.

Brugman, Hans, to Brugman Machinefabriek B.V. Method for treating a textile web with steam. 4,137,045, Cl. 8-149.100.

Brugman Machinefabriek B.V.: *See—*
Brugman, Hans, 4,137,045, Cl. 8-149.100.

Brunelli, Alessandro: *See—*
Coralli, Giorgio V.; and Brunelli, Alessandro, 4,136,540, Cl. 70-100.000.

Brunner, Stanley N.: *See—*
Bartley, George S.; and Brunner, Stanley N., 4,137,491, Cl. 318-685.000.

Bryant Manufacturing Pty. Limited: *See—*
Bryant, Stanley, 4,137,440, Cl. 200-159.00R.

Bryant, Stanley, to Bryant Manufacturing Pty. Limited. Electrical switch. 4,137,440, Cl. 200-159.00R.

Bubik, Alfred; and Schultz, Hans-Joachim, to Escher Wyss GmbH. Head box for a papermaking machine. 4,137,124, Cl. 162-343.000.

Bucholtz, Glen E.: *See—*
Copeland, Francis E.; Bucholtz, Glen E.; and Finegold, Hyman B., 4,136,433, Cl. 29-564.600.

Buckl, Hans; and Fahn, Rudolf, to Sud-Chemie Aktiengesellschaft. Process for the two-stage composition of the hemicelluloses of xylane-containing natural products for the purpose of obtaining xylose. 4,137,395, Cl. 536-1.000.

Bucksbaum, Arnold M., to Amana Refrigeration, Inc. Microwave oven door seal system. 4,137,441, Cl. 219-10.55D.

Budden, Raymond G.; Scott, Fraser; and Dickinson, Ivan F. R., to Ring Sights Limited. Collimator gunsight. 4,136,963, Cl. 356-251.000.

Budoff, Jules. Drill jig. 4,137,003, Cl. 408-103.000.

Bue, Richard C.; and Carlson, Casey L., to Sico Incorporated. Folding wall table. 4,136,622, Cl. 108-48.000.

Bull, William T., to Advance Nailing Tools, Inc. Automatic nailer gun and magazine. 4,136,810, Cl. 227-120.000.

Bundle, David R.: *See—*
Lemieux, Raymond U.; Bundle, David R.; and Baker, Donald A., 4,137,401, Cl. 536-116.000.

Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-9-methylene-PGF_2 cycloamides. 4,137,403, Cl. 542-426.000.

Bunker Ramo Corporation: *See—*
Harnett, Herbert M., 4,136,442, Cl. 29-629.000.
Spaulding, Tedford H., 4,136,923, Cl. 339-258.00R.

Bureau de Recherches Geologiques et Minieres: *See—*
Clin, Francois; Gony, Jean-Noel; and Proust, Francois, 4,137,155, Cl. 209-134.000.

Burgdorf, Jochen; and Stoka, Roberto, to ITT Industries, Inc. Spot-type disc brake. 4,136,761, Cl. 188-73.300.

Burlington Industries, Inc.: *See—*
Wortman, Jimmie J.; Whisnant, Richard A.; and Monteith, Larry K., 4,136,778, Cl. 209-589.000.

Burndy Corporation: *See—*
Lytle, Thomas G.; and Bauer, Alajos Z., 4,136,549, Cl. 72-453.160.

Burns, Robert B., to Texaco Development Corporation. Directional drilling marine structure. 4,136,996, Cl. 405-195.000.

Burroughs Corporation: *See—*
Durney, David J., 4,136,444, Cl. 29-764.000.
Hunter, James R.; Lazzarotti, Sebastian J.; and Bradshaw, Robert S., 4,136,780, Cl. 209-539.000.
Spencer, David H., 4,137,564, Cl. 364-200.000.

Burton, Vance P.: *See—*
Mikulicz, Michael Z.; and Burton, Vance P., 4,137,274, Cl. 260-683.15C.

Bushnell, Calvin L.: *See—*
Jalan, Vinod M.; and Bushnell, Calvin L., 4,137,372, Cl. 429-44.000.
Jalan, Vinod M.; and Bushnell, Calvin L., 4,137,373, Cl. 429-44.000.

B.V. Koninklijke Maatschappij "De Schelde": *See—*
Mulock Houwer, Johan H., 4,136,789, Cl. 214-16.00B.

C. van der Lely N.V.: *See—*
Rambach, Celestin, 4,136,741, Cl. 172-47.000.

Cabrera, Pedro P.; and Duncan, Robert T., to Coulter Electronics, Inc. Method and apparatus for regulating the size and frequency of bubbles employed for mixing liquids. 4,136,970, Cl. 366-101.000.

Cade, Phillip J., to Electronics Corporation of America. Burner control apparatus. 4,137,035, Cl. 431-78.000.

Caldwell, Ben L. Board game apparatus. 4,136,878, Cl. 273-237.000.

California R&D Center: *See—*
Jones, Lawrence T.; Sims, Anson; and Howden, Ashley G., 4,136,485, Cl. 46-251.000.

Calvin, Douglas G.: *See—*
Howard, Curtis E.; Calvin, Douglas G.; and Pitts, Robert W., Jr., 4,136,737, Cl. 166-251.000.

Camp 7, Inc.: *See—*
McMillan, Marguerite R., 4,136,452, Cl. 33-17.00R.

Candolin, Carl-Johan: *See—*
Suominen, Jorma; Candolin, Carl-Johan; and Ronnholm, Arvi, 4,137,134, Cl. 203-73.000.

Cannon, Collins P.; and Brown, Donald P., to United States of America, Energy. Nuclear instrumentation cable end seal. 4,137,423, Cl. 174-19.000.

Cannon Limited: *See—*
Brooks, Alfred W., 4,137,029, Cl. 425-222.000.

Canon Denshi Kabushiki Kaisha: *See—*
Torita, Tomohiko; Okada, Toru; and Yokota, Yuji, 4,136,819, Cl. 235-431.000.

Canon Kabushiki Kaisha: *See—*
Mashimo, Yukio; Uchidoi, Masanori; Yamamichi, Masayoshi; Ito, Fumio; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,137,541, Cl. 354-23.00D.
Matsufuji, Yoji, 4,137,192, Cl. 252-299.000.
Nakahata, Kimio; and Tamura, Yasuyuki, 4,136,942, Cl. 355-3.0CH.
Torita, Tomohiko; Okada, Toru; and Yokota, Yuji, 4,136,819, Cl. 235-431.000.
Tsunoda, Takashi, 4,137,563, Cl. 364-200.000.

Canron, Inc.: *See—*
Short, Wilbur G., 4,136,593, Cl. 83-624.000.

Capraro, Michael A.: *See—*
Louvar, Joseph F.; Capraro, Michael A.; and Herring, William M., 4,137,396, Cl. 536-4.000.

Cardwell, Paul H.; and Kane, William S., to Deepsea Ventures, Inc. Extraction of metal values from manganese nodules. 4,137,291, Cl. 423-24.000.

Carl Freudenberg, Firma: *See—*
Schmidt, Klaus; Hoffmann, Harald; and Fahrback, Erich, 4,137,379, Cl. 429-254.000.

Carl Zeiss Stiftung: *See—*
Glatzel, Erhard, 4,136,931, Cl. 350-189.000.

Carlson, Casey L.: *See—*
Bue, Richard C.; and Carlson, Casey L., 4,136,622, Cl. 108-48.000.

Carnegie-Mellon University: *See—*
Shaw, Milton C.; Komanduri, Rangachary; and Kumekawa, Soichi, 4,137,516, Cl. 338-67.000.

Caryotakis, George; Chan, George; Falce, Louis R.; Luebke, William R., deceased (by Luebke, Robin N., executrix); and Wood, Walter, to Varian Associates, Inc. Periodic permanent magnet focused TWT. 4,137,482, Cl. 315-3.500.

Case, John R.: *See—*
Brown, Geoffrey T.; and Case, John R., 4,137,199, Cl. 521-138.000.

Caspari, Guntar, to Standard Oil Company (Indiana). Hydrocarbyl titanate dithiophosphate compositions and processes. 4,137,183, Cl. 252-32.70E.

Cassata, John R., to Olin Corporation. Process for toluene diamine recovery. 4,137,266, Cl. 260-578.000.

Cassella Aktiengesellschaft: *See—*
Bauer, Wolfgang; and Ribka, Joachim, 4,137,228, Cl. 260-146.00R.

Castelijns, Adrianus P. J.: *See—*
Asselman, George A. A.; Green, David B.; Castelijns, Adrianus P. J.; Naastepad, Pieter A.; and de Ruiter, Jacob W., 4,136,733, Cl. 165-32.000.

Caterpillar Tractor Co.: *See—*
Gates, Marvin A., 4,136,658, Cl. 123-140.0MC.

Caudel, Edward R., to Texas Instruments Incorporated. Signal strength measuring transceiver. 4,137,499, Cl. 325-67.000.

Cavitron Corporation: *See—*
Broadwin, Alan; Weiss, Steven N.; and Enker, Stanley H., 4,136,700, Cl. 128-305.000.

CBS Inc.: *See—*
Fabricant, Norman; and Moustakas, Matthew A., 4,136,480, Cl. 46-17.000.

Cederquist, Karl; Marechal, Bernard; and Selander, Stig, to Isel S.A. Method and apparatus for minimizing steam consumption in the production of pulp for fiberboard and the like. 4,136,831, Cl. 241-18.000.

Celanese Corporation: *See—*
DeMartino, Ronald N.; and Conciatori, Anthony B., 4,137,400, Cl. 536-114.000.

Celanese Polymer Specialties Company: *See—*
Belanger, William J., 4,137,140, Cl. 204-181.00C.
Centille, Edward E. Safety device for firearms. 4,136,475, Cl. 42-1.0LP.
Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie: *See—*
Mairy, Bernard, 4,136,952, Cl. 356-36.000.
Century Specialties, Inc.: *See—*
Owsen, Paul J., 4,136,455, Cl. 33-147.00F.
Chadha, Naresh K.; Partridge, John J., Jr.; and Uskokovic, Milan R., to Hoffmann-La Roche Inc. Asymmetric synthesis of optically active prostaglandins. 4,137,244, Cl. 260-395.000.
Chaikin, Saul W., to Wik-It Electronics Corporation. Visual dye indicator of solder wicking action in metal coated copper braid. 4,137,369, Cl. 428-624.000.
Chakrabarti, Paritosh M.; and Grifo, Richard A., to GAF Corporation. Detergent composition comprising synergistic hydrotrope mixture of two classes of organic phosphate esters. 4,137,190, Cl. 252-135.000.
Chan, George: *See—*
Caryotakis, George; Chan, George; Falce, Louis R.; Luebke, William R., deceased; and Wood, Walter, 4,137,482, Cl. 315-3.500.
Chan, Ka-Kong; and Pawson, Beverly A., to Hoffmann-La Roche Inc. Fluorinated aromatic polyenes. 4,137,246, Cl. 260-408.000.
Chandler, Ronald W.: *See—*
Mueller, Frederick N.; and Chandler, Ronald W., 4,136,561, Cl. 73-171.000.
Mueller, Frederick N.; and Chandler, Ronald W., 4,136,563, Cl. 73-194.00E.
Chaney, Rolland W.: *See—*
Starkey, Walter D.; and Chaney, Rolland W., 4,137,040, Cl. 432-128.000.
Chang, Leroy L.; and Esaki, Leo, to International Business Machines Corporation. Semiconductor structure. 4,137,542, Cl. 357-16.000.
Chanin, Gerald; and Torre, Jean-Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Portable helium 3 cryostat. 4,136,526, Cl. 62-48.000.
Chapman, Marcus R. Floating wall oil container. 4,136,997, Cl. 405-210.000.
Chapron, Claude, to U.S. Philips Corporation. Threshold-effect integrated injection logic circuit with hysteresis. 4,137,469, Cl. 307-291.000.
Chem-tronics, Inc.: *See—*
Brimm, Daniel J., 4,137,118, Cl. 156-345.000.
Chembiomed Limited: *See—*
Lemieux, Raymond U.; Bundle, David R.; and Baker, Donald A., 4,137,401, Cl. 536-116.000.
Chemetron Corporation: *See—*
Hansen, Arne; and Troup, George, 4,136,851, Cl. 251-63.000.
Chemko Industries, Inc.: *See—*
Cyphert, Gilbert C.; and Lynch, Patrick E., Jr., 4,136,420, Cl. 15-321.000.
Chen, Schoen-nan; and Harrison, Kenneth J., to Optel Corporation. Reversible printing display. 4,137,524, Cl. 340-765.000.
Cherepanova, Valentina P.: *See—*
Khromov-Borisov, Nikolai V.; Torf, Samuil F.; Cherepanova, Valentina P.; and Danilov, Anatoly F., 4,137,239, Cl. 260-326.820.
Cherry, Isaac R.: *See—*
Anderson, Donald L.; and Cherry, Isaac R., 4,136,690, Cl. 128-2.06A.
Chester, Arthur W.; Schwartz, Albert B.; and Stover, William A., to Mobil Oil Corporation. Selective high conversion cracking process. 4,137,152, Cl. 208-120.000.
Chevron Research Company: *See—*
Bakker, Nicolaas, 4,137,184, Cl. 252-33.000.
Csicsery, Sigmund M., 4,137,151, Cl. 208-120.000.
Lowe, Warren, 4,137,187, Cl. 252-46.600.
Meyer, Jarold A., 4,137,146, Cl. 208-60.000.
Mitchell, David S.; and Sageman, David R., 4,137,053, Cl. 48-197.00R.
Chloride Silent Power Limited: *See—*
Clegg, Gordon A.; and Lauder, David R., 4,137,376, Cl. 429-104.000.
Choquet, Michel; Pilost, Daniel; and Vade, Andre, to International Business Machines Corporation. Synchronizing device for the receiver clock of a data transmission system using PSK modulation. 4,137,427, Cl. 178-69.100.
Christensen, Douglas A., to University of Utah. Semiconductor temperature sensor. 4,136,566, Cl. 73-356.000.
Christiansen, Arvid, to Miranol Chemical Company, Inc., The. Nitrogenous condensation products. 4,137,245, Cl. 260-404.500.
Christner, Willis D.; and Ortman, Howard J., to Kroger Company, The. Dispensed cone covering and method of vending. 4,136,800, Cl. 221-1.000.
Christoph, Guenter: *See—*
Engelmann, Gottfried; and Christoph, Guenter, 4,136,809, Cl. 226-79.000.
Chrysler Corporation: *See—*
O'Rourke, John D.; and Flockencier, Stuart W., 4,136,467, Cl. 35-25.000.
Chu, Chin-Chiun, to Mobil Oil Corporation. Catalyst for disproportionation of toluene. 4,137,195, Cl. 252-437.000.
Ciarniello, Giorgio; and De Lena, Oscar, to Societa Italiana Vetro S/V S.p.A. Automatic cut-out device. 4,137,557, Cl. 361-92.000.
Ciba-Geigy AG: *See—*
Defago, Raymond; Koller, Stefan; and Moser, Peter, 4,137,042, Cl. 8-2.50A.
Ciba-Geigy Corporation: *See—*
Berger, Alfred, 4,137,251, Cl. 260-458.00C.
Gatzi, Karl, 4,137,067, Cl. 71-94.000.
Seltzer, Raymond; and DiPrima, Joseph F., 4,137,139, Cl. 204-159.230.
Sheth, Pravin; and Leeson, Lewis J., 4,137,300, Cl. 424-21.000.
Cimon, Denis G.: *See—*
Paris, Gerald Y.; Cimon, Denis G.; and Garmaise, David L., 4,137,317, Cl. 424-256.000.
Cincinnati Milacron, Inc.: *See—*
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,137,301, Cl. 424-45.000.
CKD DUKLA, narodni podnik: *See—*
Novotny, Pavel; and Fiala, Ludvik, 4,136,642, Cl. 122-4.00D.
Claasen, Gayle L., administratrix: *See—*
Kordyban, William W.; and Claassen, Lutz, deceased, 4,136,590, Cl. 83-169.000.
Claassen, Lutz, deceased: *See—*
Kordyban, William W.; and Claassen, Lutz, deceased, 4,136,590, Cl. 83-169.000.
Claeson, Karl G.: *See—*
Af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,137,225, Cl. 260-112.50R.
Claesson, Tore V.; and Gustavsson, Gustav R. A., to Sandvik Aktiebolag. Plug for making electrical interconnection. 4,136,918, Cl. 339-31.00R.
Clamp, Frank: *See—*
Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, 4,137,297, Cl. 423-561.00R.
Clark, Benny J.: *See—*
Clark, Elin R.; Clark, Benny J.; and Lang, Jerry M., 4,136,991, Cl. 404-73.000.
Clark, Elin R.; Clark, Benny J.; and Lang, Jerry M., to Clark, Elin R.; and Clark, Benny J. Roadway marker and process of and application for producing the same. 4,136,991, Cl. 404-73.000.
Clark Equipment Company: *See—*
Duttarer, Ralph M., 4,136,892, Cl. 280-479.00R.
Duttarer, Ralph M., 4,136,909, Cl. 298-17.00B.
Clark, Gary E., to Miller, Maurice L., Jr., a part interest. Tiltable vehicle loading ramp. 4,136,791, Cl. 214-85.000.
Clarke, E. Colin W.: *See—*
Glew, David N.; and Clarke, E. Colin W., 4,137,296, Cl. 423-478.000.
Clegg, Gordon A.; and Lauder, David R., to Chloride Silent Power Limited. Sodium sulphur batteries comprising a plurality of separate cells within a container. 4,137,376, Cl. 429-104.000.
Clemens, David H.: *See—*
Glavis, Frank L.; and Clemens, David H., 4,137,264, Cl. 260-567.60M.
Clin, Francois; Gony, Jean-Noel; and Proust, Francois, to Bureau de Recherches Geologiques et Minieres. Method of and apparatus for pneumatically sorting heterogeneous mixtures. 4,137,155, Cl. 209-134.000.
Cline, Carl F.: *See—*
Ray, Ranjan; Tanner, Lee E.; and Cline, Carl F., 4,137,075, Cl. 75-174.000.
Clodfelter, Glen A.; and Fruchtnicht, Ocke C., to United States of America, Army. Filament/epoxy camouflage launch tubes. 4,137,351, Cl. 428-36.000.
CMI Corporation: *See—*
Swisher, George W., Jr., 4,136,964, Cl. 366-23.000.
Coal Industry (Patents) Limited: *See—*
Plummer, Derek, 4,136,910, Cl. 299-31.000.
Coca-Cola Company, The: *See—*
Gomm, Thiel; and Price, Stephen E., 4,136,930, Cl. 358-106.000.
Coe, Stanley S., to Mead Corporation, The. Manually adjustable indicating device. 4,136,473, Cl. 40-518.000.
Coffey, William R.: *See—*
Crute, Billy G.; Ruhl, Henry; and Coffey, William R., 4,136,795, Cl. 220-203.000.
Cohn, Charles C. Safety matchbook and matches. 4,136,770, Cl. 206-106.000.
Coleman, Martin W.; and Northup, Edwin M., to Allis-Chalmers Corporation. Closed-loop combine header height control. 4,136,508, Cl. 56-208.000.
Coleman, Michael G.: *See—*
Bailey, William L.; Coleman, Michael G.; Harris, Cynthia B.; and Lesk, Israel A., 4,137,123, Cl. 156-647.000.
Colgate Palmolive Company: *See—*
Falivene, Pasquale J., 4,137,345, Cl. 427-242.000.
Gaffar, Abdul; and Volpe, Anthony R., 4,137,303, Cl. 424-52.000.
Collado, Juan; and Leon, Enrique, to International Telephone and Telegraph Corporation. Automatic calling directory. 4,136,820, Cl. 235-460.000.
Collins, Albert V.: *See—*
Bak, Eugene; and Collins, Albert V., 4,137,359, Cl. 428-295.000.
Collins, James A.; and Quinn, Thomas H., to H. B. Fuller Company. Absorbent article with adhesive strip. 4,136,699, Cl. 128-290.00R.
Combustion Unlimited Incorporated: *See—*
Straitz, John F., III, 4,137,036, Cl. 431-202.000.
Cominco Ltd.: *See—*
Willans, Robert D. H., 4,137,130, Cl. 204-12.000.

Compagnie General de Geophysique: *See*—
Manin, Michel, 4,136,754, Cl. 181-111.000.
Compagnie Generale d'Electricite S.A.: *See*—
Desplanches, Gerard; Lazennec, Yvon; and Leboucq, Jacques, 4,137,287, Cl. 264-62.000.
Lasne, Claude; and Gernez, Alain, 4,137,344, Cl. 427-156.000.
Comstock, Walter F., to Outdoor Enterprises of America, Inc. Oceanic wave powered prime mover. 4,137,005, Cl. 415-2.000.
Concast AG: *See*—
Schmid, Markus, 4,136,728, Cl. 164-444.000.
Conciatori, Anthony B.: *See*—
DeMartino, Ronald N.; and Conciatori, Anthony B., 4,137,400, Cl. 536-114.000.
Connell, Joseph A.: *See*—
du Pont, Anthony A.; and Connell, Joseph A., 4,137,052, Cl. 48-89.000.
Connolly, Hugh R., to Bemis Company, Inc. Elastic plastic netting, and pallet load wrapping therewith. 4,136,501, Cl. 53-461.000.
Container Corporation of America: *See*—
Gardner, Jeffrey M., 4,136,815, Cl. 229-15.000.
Gardner, Jeffrey M., 4,136,816, Cl. 229-33.000.
Continental Group, Inc., The: *See*—
Mascia, Carmen T.; and Hasegawa, Gary K., 4,136,772, Cl. 206-199.000.
Mascia, Carmen T.; and Hasegawa, Gary K., 4,136,802, Cl. 222-95.000.
Continental Oil Company: *See*—
Zielke, Clyde W.; and Gorin, Everett, 4,137,298, Cl. 423-648.00R.
Cook, Calvin: *See*—
Meyers, Michael R.; Langieri, Michael; and Cook, Calvin, 4,136,871, Cl. 273-85.00A.
Cook, Gerald H.; and Holmes, William A., to Polaroid Corporation. Rear projection viewer having auxiliary viewing screen. 4,136,935, Cl. 352-104.000.
Cook, John A.: *See*—
Barker, Edison D.; and Cook, John A., 4,137,002, Cl. 408-59.000.
Copeland, Francis E.; Bucholtz, Glen E.; and Finegold, Hyman B., to Globe Tool and Engineering Company, The. Insulation feeding, cutting and inserting machines. 4,136,433, Cl. 29-564.600.
Coralli, Giorgio V.; and Brunelli, Alessandro, to Viro Innocenti S.p.A. Rolling gates cylinder lock. 4,136,540, Cl. 70-100.000.
Corbet, John S.; Basford, John; and Hemming, James R., to Poulton & Son (Refractories) Limited. Flame injection throats for furnaces. 4,136,625, Cl. 431-336.000.
Cordes, Claus: *See*—
Theysohn, Rainer; Penzien, Klaus; Seydl, Wolfgang; Wurmb, Rolf; Reimann, Horst; Cordes, Claus; and Sterzel, Hans-Josef, 4,137,212, Cl. 260-37.00N.
Corning Glass Works: *See*—
Anderson, Joseph W.; Guile, Donald L.; and Smith, Roy E., 4,136,828, Cl. 239-422.000.
Young, Roy V., II, 4,136,961, Cl. 356-239.000.
Cornwall, Della E. Adjustable buttonhole sewing guide. 4,136,460, Cl. 33-190.000.
Corsmeier, Robert J., to General Electric Company. Gas turbine with secondary cooling means. 4,136,516, Cl. 60-39.09R.
Coscia, Anthony T.; and O'Connor, Michael N. D., to American Cyanamid Company. Process for clarifying iron ore slimes. 4,137,164, Cl. 210-54.000.
Coscia, Anthony T.; and O'Connor, Michael N. D., to American Cyanamid Company. Process for clarifying raw water. 4,137,165, Cl. 210-54.000.
Cosentino, Louis C.; and Gallant, Stuart L., to Renal Systems, Inc. Hemodialysate blending system. 4,136,708, Cl. 137-99.000.
Cossement, Eric: *See*—
Rodriguez, Ludovic; Leclercq, Jacques; Ykman, Pierre; and Cossement, Eric, 4,137,236, Cl. 260-306.70C.
Couch, Thomas W.; Harvey, James A.; and Tummers, Gerardus L. J., to Akzona Incorporated. Device for use as an elapsed time indicator or time temperature indicator. 4,137,049, Cl. 422-56.000.
Couderc, Jean-Francois, to Societe Industrielle de Brevets et d'Etudes, S.I.B.E. Starting facilities for internal combustion engine caburetors. 4,137,283, Cl. 261-39.00B.
Coueille, Daniel, to Saft-Societe des Accumulateurs Fixes et de Traction. Button type electric cells. 4,137,375, Cl. 429-66.000.
Coulter Electronics, Inc.: *See*—
Cabrera, Pedro P.; and Duncan, Robert T., 4,136,970, Cl. 366-101.000.
Cox, David A.; Barnish, Ian T.; and Evans, Anthony G., to Pfizer Inc. Phenyl-alkanolamine, alkylamine and α-aminoalkyl ketone derivatives as heart stimulants. 4,137,328, Cl. 424-324.000.
Crawford, James V.: *See*—
Godsey, Randall D.; Svacha, Roy E.; Crawford, James V.; and Janowski, Kenneth R., 4,136,428, Cl. 29-157.400.
Crawford, LeRoy A.; and Trible, Paul S., to Sperry Rand Corporation. Feeder finger assembly for hay balers. 4,136,510, Cl. 56-341.000.
Crayne, Robert P. Mount for barber chair accessory. 4,136,908, Cl. 297-188.000.
Creavco, Inc.: *See*—
Jones, David W., 4,136,714, Cl. 138-30.000.
Credelle, Thomas L.; Hannan, William J.; and Spong, Fred W., to RCA Corporation. Broadening the spatial frequency pass band of a thermoplastic layer. 4,137,077, Cl. 96-1.100.
Credelle, Thomas L., to RCA Corporation. Color flat panel television. 4,137,478, Cl. 313-422.000.
Criswell, Thomas: *See*—
Mager, George E.; Nelson, Frank M.; Gillett, Kenneth; Holt, Charles P.; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; Criswell, Thomas; and Hall, Warren L., 4,137,565, Cl. 364-200.000.
Crompton, Eric J.; Poissant, Serge; and Fordyce, Ian, to Northern Telecom Limited. Loading coil assemblies for communication cables. 4,137,426, Cl. 178-46.000.
Crooker, Stephen M. Audible speed indicator for hang glider. 4,136,562, Cl. 73-187.000.
Crown Cork & Seal Company, Inc.: *See*—
Potts, Vinson S., 4,136,797, Cl. 220-271.000.
Crown Zellerbach Corporation: *See*—
Reba, Imants, 4,136,808, Cl. 226-7.000.
Crump, Leslie L.: *See*—
Reece, John W.; Italiano, Victor J.; and Crump, Leslie L., 4,137,513, Cl. 335-219.000.
Crute, Billy G.; Ruhl, Henry; and Coffey, William R., to Stant Manufacturing Company, Inc. Plastic radiator cap. 4,136,795, Cl. 220-203.000.
Csicsery, Sigmund M., to Chevron Research Company. Hydrocarbon conversion with cracking catalyst having co-combustion promoters lanthanum and iron. 4,137,151, Cl. 208-120.000.
Cumpston, Edward H. Dispersion or suspension of solid phase in liquid phase. 4,137,092, Cl. 106-288.00B.
Curtis, Jack. Camera matte box. 4,137,540, Cl. 354-296.000.
Curtiss-Wright Corporation: *See*—
Jones, Charles, 4,137,024, Cl. 418-61.00A.
Custom Automatic: *See*—
Murdock, Robert H., 4,136,856, Cl. 256-24.000.
Cutler-Hammer, Inc.: *See*—
Brozoski, Daniel J.; and Pupak, Pupak T., 4,137,490, Cl. 318-345.00G.
Cutter, Louis A., to United States Steel Corporation. Polystyrene with distinct moieties of molecular weight distribution. 4,137,388, Cl. 526-73.000.
Cyphert, Gilbert C.; and Lynch, Patrick E., Jr., to Chemko Industries, Inc. Carpet soil extracting wand having a powered brush. 4,136,420, Cl. 15-321.000.
Dabroski, Winifred C., to Johnson & Johnson. Water resistant orthopedic cast. 4,136,687, Cl. 128-91.00R.
Dafoe, Charles A., to Gynetech-Denver, Inc. Transvaginal sterilization instrument. 4,136,695, Cl. 128-215.000.
Daguise, Dominique D., to Societe Anonyme dite: Au Cachet Lorrain. Apparatus for stamping articles, especially metal sheets. 4,136,612, Cl. 101-18.000.
Dahlbeck, Edwin L.; and Dahlbeck, Verna H. Lightweight removable cover for a pool, greenhouse or the like. 4,136,408, Cl. 4-172.120.
Dahlbeck, Verna H.: *See*—
Dahlbeck, Edwin L.; and Dahlbeck, Verna H., 4,136,408, Cl. 4-172.120.
Dahmen, David L.; and Zapata, Luis, to Remaches Industriales S.A. Method and machine for forming a hollow rivet. 4,136,417, Cl. 10-27.00R.
Dai Nippon Toryo Co., Ltd.: *See*—
Sakakibara, Takao; and Okazaki, Haruhiko, 4,137,349, Cl. 427-380.000.
Daicel Ltd.: *See*—
Harada, Yuichi; and Ohya, Yoshinobu, 4,137,366, Cl. 428-425.000.
Ono, Koichi; Takahara, Toshiyuki; and Ito, Tetsuyoshi, 4,136,894, Cl. 280-729.000.
Daman, Lloyd W.; Marti, Don V., II; Newsom, Michael L.; and Shamp, Donald E., to Libbey-Owens-Ford Company. Method of repairing furnace roofs during heat-up. 4,137,037, Cl. 432-3.000.
Dammgen, Jurgen: *See*—
Eberlein, Wolfgang; Heider, Joachim; Austel, Volkhard; Dammgen, Jurgen; and Kadatz, Rudolf, 4,137,318, Cl. 424-258.000.
Danilov, Anatoly F.: *See*—
Khromov-Borisov, Nikolai V.; Torf, Samuil F.; Cherepanova, Valentina P.; and Danilov, Anatoly F., 4,137,239, Cl. 260-326.820.
Dargitz, Larry L.: *See*—
Morrow, Gary R.; and Dargitz, Larry L., 4,136,786, Cl. 212-76.000.
Das, Tapan K.: *See*—
Bernier, Lornie J.; and Das, Tapan K., 4,137,043, Cl. 8-4.000.
Daswick, Alexander C. Packaged meat sandwich. 4,137,333, Cl. 426-120.000.
Data Recording Instrument Company Limited: *See*—
Piper, Ronald N., 4,136,979, Cl. 400-616.200.
Data View, Inc.: *See*—
Fettig, Lyle A., 4,136,937, Cl. 353-27.00R.
Datta, Rathin: *See*—
Wildman, George T.; and Datta, Rathin, 4,137,405, Cl. 544-20.000.
Daughton, John W.: *See*—
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Daum, Gerhard; and Vogt, Wilhelm, to Dynamit Nobel Aktiengesellschaft. Method of preparing aminoacetaldehyde acetals by the hydrogenation of dialkoxyacetonitrile. 4,137,268, Cl. 260-584.00C.
David, Howard C.: *See*—
Walter, Erhard P., 4,136,901, Cl. 294-19.00A.
David, Morton E.: *See*—
Hardy, George F.; and David, Morton E., 4,136,921, Cl. 339-141.000.

Davis, Allen V. C. Fluid pressure responsive device. 4,137,434, Cl. 200-83.00P.
Davis, Ariel R. Solar heat storage and utility system. 4,136,668, Cl. 126-270.000.
Davis, George B., Jr. Resistance disk. 4,137,518, Cl. 338-150.000.
Davis, Gerald T.; and Shackle, Dale R., to Mead Corporation, The. Process for producing pressure-sensitive copy sheets using novel radiation curable coatings. 4,137,084, Cl. 106-21.000.
Davis, Gerald T.; Schwab, Gerhart; and Shackle, Dale R., to Mead Corporation, The. Process for producing pressure-sensitive carbonless transfer sheets. 4,137,343, Cl. 427-150.000.
Davis, Samuel B., Jr., to Textron Inc. Lockbolt collar. 4,136,596, Cl. 85-7.000.
Davis, Theodore L. Solar heating collector apparatus. 4,136,670, Cl. 126-271.000.
Davot, Micheline: *See*—
Humbert, Francoise; and Davot, Micheline, 4,137,302, Cl. 424-47.000.
Day, John T.; Herder, Robert O.; Blockwick, Thomas N.; Brockman, Dan B.; Sharpe, John F.; and Hildebrand, Richard W., to Ocean Systems, Inc.; and Rubber Millers, Inc. Marine fender. 4,136,632, Cl. 114-220.000.
Dayton G.R.P. S.r.l.: *See*—
Piola, Aldo, 4,137,119, Cl. 156-431.000.
De La Rue Instruments Limited: *See*—
Jenkins, Stuart M.; King, Albert K.; and Reece, Raymond D., 4,136,454, Cl. 33-147.00L.
De luxe General, Incorporated: *See*—
Degenkolb, David J.; and Scobey, Fred J., 4,137,290, Cl. 423-1.000.
DeBoer, Richard J. Heat transfer apparatus. 4,136,731, Cl. 165-12.000.
De Brandt, Constantine W. M. V. A.: *See*—
Blanchart, Alain P. O.; Spaepen, Gustaaf J. F.; and De Brandt, Constantine W. M. V. A., 4,137,371, Cl. 429-29.000.
Debus, Gerhard; and Knittel, Volker, to Hoechst Aktiengesellschaft. Plasticizer combination for building materials. 4,137,088, Cl. 106-90.000.
Deepsea Ventures, Inc.: *See*—
Cardwell, Paul H.; and Kane, William S., 4,137,291, Cl. 423-24.000.
Deere & Company: *See*—
Dobberpuhl, Dale R., 4,136,983, Cl. 403-108.000.
Defago, Raymond; Koller, Stefan; and Moser, Peter, to Ciba-Geigy AG. Dry heat process for dyeing and printing organic material which can be dyed with cationic dyes. 4,137,042, Cl. 8-2.50A.
Deffeyes, Robert J.; and Johnson, Grover L., to Graham Magnetics Incorporated. Powder products. 4,137,361, Cl. 428-328.000.
Degenkolb, David J.; and Scobey, Fred J., to De luxe General, Incorporated. Method and apparatus for recovery of heavy metal ions from dilute aqueous solution. 4,137,290, Cl. 423-1.000.
Deis, Jerome E.: *See*—
Bell, Frederick K.; Deis, Jerome E.; and Allen, Paul E., 4,136,458, Cl. 33-174.00L.
Deister, Emil E.; and Deister, Emil M., to Deister Machine Company, Inc. Screen tension assembly for vibratory screening apparatus. 4,137,157, Cl. 209-403.000.
Deister, Emil M.: *See*—
Deister, Emil E.; and Deister, Emil M., 4,137,157, Cl. 209-403.000.
Deister Machine Company, Inc.: *See*—
Deister, Emil E.; and Deister, Emil M., 4,137,157, Cl. 209-403.000.
Del Mar Avionics: *See*—
Anderson, Donald L.; and Cherry, Isaac R., 4,136,690, Cl. 128-2.06A.
Delehouzee, Leon: *See*—
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De Lena, Oscar: *See*—
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della Porta, Paolo; Ferrario, Bruno; and Rosai, Livio, to S.A.E.S. Getters S.p.A. Modular getter pumps. 4,137,012, Cl. 417-51.000.
Delray Electronics Inc.: *See*—
Malley, Frank; and Akers, Raymond F., 4,137,494, Cl. 324-30.00R.
Delvo, Bernd. Readout cassette. 4,136,472, Cl. 40-471.000.
Demaray, Merlin E.; and Attridge, Russell G., Jr., to Ranco Incorporated. Method and apparatus for controlling air-conditioning systems. 4,136,732, Cl. 165-16.000.
DeMarinis, Robert M., to SmithKline Corporation. 7-Dithioacetamido cephalosporins and pharmaceutical compositions and methods employing them having antibacterial activity. 4,137,314, Cl. 424-246.000.
DeMartino, Ronald N.; and Conciatori, Anthony B., to Celanese Corporation. Polygalactomannan ether compositions. 4,137,400, Cl. 536-114.000.
Demkowicz, Michael P.: *See*—
Mack, Frank J.; and Demkowicz, Michael P., 4,136,825, Cl. 239-44.000.
Demoute, Jean-Pierre: *See*—
Perronnet, Jacques; Demoute, Jean-Pierre; Girault, Pierre; and Teche, Andre, 4,137,068, Cl. 71-98.000.
Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Ishii, Masaji; Watanabe, Shuzo; Miyai, Akira; and Hiraoka, Hideo, 4,137,476, Cl. 313-336.000.
Denton, Charles L.: *See*—
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Denz, Peter: *See*—
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Derner, William J., to FMC Corporation. Ball bearing retainer. 4,136,915, Cl. 308-201.000.
de Ruiter, Jacob W.: *See*—
Asselman, George A. A.; Green, David B.; Castelijns, Adrianus P. J.; Naastepad, Pieter A.; and de Ruiter, Jacob W., 4,136,733, Cl. 165-32.000.
Desormiere, Bernard; and Volluet, Gerard, to Thomson-CSF. Magnetostrictive elastic surface wave structure. 4,137,470, Cl. 310-26.000.
DeSoto, Inc.: *See*—
Berenschot, Donald J.; Anders, Dale F.; and Hawker, Fred D., 4,137,205, Cl. 260-29.4UA.
Desplanches, Gerard; Lazennec, Yvon; and Leboucq, Jacques, to Compagnie Generale d'Electricite S.A. Method of preparing beta alkaline alumina parts. 4,137,287, Cl. 264-62.000.
DeTorre, Robert P., to PPG Industries, Inc. Method of opening score lines in glass sheets. 4,136,807, Cl. 225-2.000.
Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See*—
Heimberger, Werner; and Schmitt, Hermann, 4,137,166, Cl. 210-62.000.
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rold; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,137,242, Cl. 260-348.250.
Deutsche Texaco Aktiengesellschaft: *See*—
Fuchs, Gundolf; and Pirck, Dietrich, 4,137,207, Cl. 260-29.60T.
Devanney, Raymond H.: *See*—
Smilgys, Bruno S.; Flis, Richard J.; and Devanney, Raymond H., 4,136,573, Cl. 74-348.000.
Deveau, Levi J. Tire pressure indicator system. 4,137,520, Cl. 340-58.000.
de Waard, Peter J.: *See*—
Nijman, Willem; and de Waard, Peter J., 4,137,107, Cl. 148-171.000.
Dickerhoff, Ronald P., to Timken Company, The. Roller-type rock bit and bearing arrangement therefor. 4,136,748, Cl. 175-337.000.
Dickey-john Corporation: *See*—
Anson, James H.; and Steffen, David E., 4,137,529, Cl. 340-684.000.
Dickinson, Ivan F. R.: *See*—
Budden, Raymond G.; Scott, Fraser; and Dickinson, Ivan F. R., 4,136,963, Cl. 356-251.000.
Dickson, Andrew C.; and Kontz, Robert F., to Owens-Illinois, Inc. Method and apparatus for making plastic articles. 4,137,031, Cl. 425-393.000.
Dickson, Billy R. Furniture construction. 4,136,623, Cl. 108-111.000.
Di Domizio, John A.: *See*—
Briechle, George T.; Di Domizio, John A.; and Weindling, Frederik, 4,137,533, Cl. 343-7.700.
Dienst, Manfred: *See*—
Brand, Wilhelm; Dienst, Manfred; Herbert, Adolf; and Henjes, Gunther, 4,136,580, Cl. 74-665.0GA.
DiFiore, Dante. Basement waterproofing system. 4,136,500, Cl. 52-742.000.
Digital Equipment Corporation: *See*—
Simmons, Elmer C., 4,137,504, Cl. 328-165.000.
DiMaggio, Joseph P., Jr. Biological staining composition and staining method. 4,137,299, Cl. 424-3.000.
Dippold, William L., to Elafuss, Inc. Tool for attaching weights to fishing line. 4,136,548, Cl. 72-409.000.
DiPrima, Joseph F.: *See*—
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Dir, Gary A.: *See*—
Adams, James E.; Haas, Werner E. L.; and Dir, Gary A., 4,136,933, Cl. 350-341.000.
Di Rosa, Gaetano, to F.A.T.A. - Fabbrica Apparecchi di Sollevamento e Trasporto Ed Affini S.p.A. Device for cutting and measuring portions or lumps of caoutchouc to be fed to a mixer for rubber. 4,136,749, Cl. 177-25.000.
Dixon, Dale D.; and Ford, Michael E., to Air Products and Chemicals, Inc. Polyalkylene carbonates as processing aids for polyvinyl chloride. 4,137,280, Cl. 260-873.000.
Dlugos, Daniel F., to Pitney-Bowes, Inc. Circuit for establishing the average value of a number of input values. 4,137,568, Cl. 364-734.000.
Dobberpuhl, Dale R., to Deere & Company. Drag stake mounting for walk-behind rotary tiller. 4,136,983, Cl. 403-108.000.
Dobrosielski, Stephen S.; Layciak, Stephen G.; and Johnston, Robert J., to Westinghouse Electric Corp. Terminal connector. 4,136,924, Cl. 339-263.00R.
Dr. C. Otto & Comp. G.m.b.H.: *See*—
Watson, Lewis A., 4,137,128, Cl. 202-256.000.
Dr.-Ing. Ludwig Pietzsch: *See*—
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Dr. Johannes Heidenhain GmbH: *See*—
Nelle, Gunther, 4,136,958, Cl. 356-169.000.
Dodd, Brian W.: *See*—
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Doi, Yoshihiko; Saito, Yasuhiro; Kobayashi, Mitsunori; and Hiraoka, Seiki, to Sumitomo Electric Industries, Ltd. Super hard metal roll assembly and production thereof. 4,137,106, Cl. 148-126.000.
Donaghy, Robert E., to General Electric Company. Process for electrolytic deposition of metals on zirconium materials. 4,137,131, Cl. 204-32.00R.
Doom, Lewis G. Premixer. 4,136,972, Cl. 366-262.000.
Doran, Samuel K.: *See*—
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Dostal, Joseph, Jr. Door operating mechanism. 4,136,769, Cl. 198-861.000.

Doub, Leonard: *See—*
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Dow Chemical Company, The: *See—*
Glew, David N.; and Clarke, E. Colin W., 4,137,296, Cl. 423-478.000.
Manfroy, Willy; and Klimpel, Richard R., 4,136,830, Cl. 241-16.000.
Moore, Eugene R.; Briggs, Roger L.; McDonald, David C.; and Hoffman, Richard, 4,137,258, Cl. 562-477.000.
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Dow Corning Corporation: *See—*
Holbrook, George W.; Jakubczak, Eugene R.; and Roth, Charles A., 4,137,189, Cl. 252-75.000.

Doyle, Nicholas E., Jr., to Foxboro Company, The. Diaphragm assembly. 4,136,603, Cl. 92-98.00R.

Dragerwerk Aktiengesellschaft: *See—*
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Dresser Industries, Inc.: *See—*
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Knight, Lloyd K., 4,136,833, Cl. 241-194.000.
Sample, Thomas E., Jr.; and Horn, John M., 4,137,367, Cl. 428-443.000.

Dubey, Michael B.: *See—*
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Dubodin, Vissarion M.: *See—*
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Dubois, Robert A.; and Gushard, William H., to Greif Bros. Corporation. Vented closure. 4,136,796, Cl. 220-256.000.

Dubovik, Alexandr I.: *See—*
Suslin, Vladimir I.; Makeev, Boris A.; Dubovik, Alexandr I.; Lekarev, Zinovy A.; Pilipenko, Vitaly A.; Etnaer, Alexandr I.; Kolesnichenko, Anatoly A.; and Razdymakha, Pavel S., 4,137,143, Cl. 204-224.00M.

Dudley, Robert H.; and Areaux, Larry D., to Reclamet, Inc. Chip discharge for continuous chip wringer. 4,137,176, Cl. 210-375.000.

Dulux Australia Ltd.: *See—*
Gunning, Raymond H.; Henshaw, Bruce C.; and Lubbock, Frederick J., 4,137,380, Cl. 521-62.000.

Duncan, Robert T.: *See—*
Cabrera, Pedro P.; and Duncan, Robert T., 4,136,970, Cl. 366-101.000.

Dunker, Peter: *See—*
Boeck, Joachim; Dunker, Peter; Fryen, Jurgen; Neumann, Dietrich; Pattberg, Georg; and Wieseke, Udo, 4,137,562, Cl. 364-200.000.

Dunlop Limited: *See—*
Goodfellow, Anthony G., 4,137,033, Cl. 425-542.000.

Dunning, Reginald: *See—*
Potter, William D.; Barclay, Andrew C.; Dunning, Reginald; and Parry, Richard J., 4,137,086, Cl. 106-52.000.

du Pont, Anthony A.; and Connell, Joseph A. Apparatus and system for producing coal gas. 4,137,052, Cl. 48-89.000.

Du Pont de Nemours, E. I., and Company: *See—*
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McCormack, Charles E.; and Brown, Martin L., 4,136,715, Cl. 138-130.000.
Peterson, Marvin L., 4,137,240, Cl. 260-340.700.
Stiles, Alvin B.; and England, David C., 4,137,271, Cl. 260-604.00R.

Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Thiazole, isothiazole, oxazole and isoxazole substituted thiourea and urea compounds. 4,137,234, Cl. 260-302.00R.

Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Pharmacologically active guanidine compounds. 4,137,237, Cl. 260-308.00R.

Durant, Graham J.; and Ganellin, Charon R., to Smith Kline & French Laboratories Limited. Guanidino, thioureido, isothioureido and nitrovinylamino derivatives of pyridine. 4,137,319, Cl. 424-263.000.

Durney, David J., to Burroughs Corporation. Semiautomatic solid chip removal apparatus. 4,136,444, Cl. 29-764.000.

Dutra, Joseph G., Jr. Load stabilizer for forklift truck. 4,136,793, Cl. 214-654.000.

Dutta, Sadhan K.; and Basu, Sanat K., to Registrar, Jadavpur University, a part interest. Erythromycin aldobionates. 4,137,397, Cl. 536-9.000.

Duttarer, Ralph M., to Clark Equipment Company. Method of connecting vehicle modules. 4,136,892, Cl. 280-479.00R.

Duttarer, Ralph M., to Clark Equipment Company. Vehicle module. 4,136,909, Cl. 298-17.00B.

Dyke, Calvin J., to Sperry Rand Corporation. Rotor for a combine. 4,136,704, Cl. 130-27.00T.

Dyke, Denis G., to Johnson & Johnson. Constant flow I.V. device. 4,136,693, Cl. 128-214.00C.

Dynamit Nobel Aktiengesellschaft: *See—*
Daum, Gerhard; and Vogt, Wilhelm, 4,137,268, Cl. 260-584.00C.
Hanisch, Horst; Rodder, Karl-Martin; and Hass, Hansjurgen, 4,137,091, Cl. 106-287.160.
Heinen, Herbert, 4,137,202, Cl. 260-23.0XA.
Hulsmann, Hans L.; and Renckhoff, Gustav, 4,137,399, Cl. 536-32.000.

Eastman Kodak Company: *See—*
Houle, Conrad G., 4,137,079, Cl. 96-55.000.
Irick, Gether, Jr.; and Kelly, Charles A., 4,137,235, Cl. 260-307.00R.
Kuo, Chung-Ming; Wang, Richard H. S.; and Bogan, Richard T., 4,137,201, Cl. 260-13.000.
Stephens, Curtis L., 4,136,945, Cl. 355-14.000.

Eastman Technology Inc.: *See—*
McClure, Richard J., 4,137,554, Cl. 360-111.000.

Eaton Corporation: *See—*
Mannhardt, Werner G., 4,136,655, Cl. 123-139.0AP.
Migrin, Robert S.; and Olson, Jerry A., 4,136,565, Cl. 73-212.000.
Wilson, Walter, 4,136,634, Cl. 188-1.00A.

Ebauches S.A.: *See—*
Rochat, Daniel, 4,136,514, Cl. 58-58.000.

Ebeling, Olavi A.; and Lunden, Risto W., to Oy Kontekla. Respiration mask. 4,136,691, Cl. 128-212.000.

Eberle Tanning Company: *See—*
Young, Harland H., 4,137,163, Cl. 210-44.000.

Eberlein, Wolfgang; Heider, Joachim; Austel, Volkhard; Dammgen, Jurgen; and Kadatz, Rudolf, to Boehringer Ingelheim GmbH. N-(phenylalkylamino-alkyl)-dihydroisoquinolinones, pharmaceutical compositions and methods employing them. 4,137,318, Cl. 424-258.000.

Eberspacher, J.: *See—*
Bauerschmidt, Walter, 4,136,757, Cl. 181-256.000.

Ebling, Wendell V.; Lamadrid, Rene G.; and Phillips, Earl G., to Baxter Travenol Laboratories, Inc. Device for separating low density material such as gas bubbles from a liquid, and the use thereof in a dialysis delivery system. 4,137,160, Cl. 210-22.00A.

Eby Company: *See—*
Sterling, Maurice, 4,136,423, Cl. 24-122.600.

Economics Laboratory, Inc.: *See—*
Flower, David M., 4,137,044, Cl. 8-137.000.

Edward Rose (Birmingham) Limited: *See—*
Ireland, Alfred L.; and Osborne, Raymond B., 4,136,906, Cl. 296-137.00C.

Edward Shanbrom, Inc.: *See—*
Shanbrom, Edward; and Bishop, Robert C., 4,137,223, Cl. 260-112.00B.

Edwards, Gayle D.; Rice, Doris M.; and Soulen, Robert L., to Texaco Development Corporation. Water-insoluble nitrogen-containing polyols. 4,137,265, Cl. 260-570.900.

Ehmig, Gerhard; and Vogt, Karl, to Vat Aktiengesellschaft fur Vakuum-Apparate-Technik. All-metal lift valve for high-vacuum applications. 4,136,854, Cl. 251-333.000.

Eichweber, Kurt. Integrated attaching and aligning apparatus for laser devices in gun barrels. 4,136,956, Cl. 356-153.000.

Eickmann, Karl. Hydraulically operated drive- and control-unit. 4,136,522, Cl. 60-484.000.

Eickmann, Karl. Hydraulically operated aircraft with a retractable propeller. 4,136,845, Cl. 244-54.000.

Einolf, Charles W., Jr., to Westinghouse Electric Corp. Detecting circuit for a photocell pattern sensing assembly. 4,137,451, Cl. 250-231.0SE.

Ejiri, Masakazu: *See—*
Uno, Takeshi; Ikeda, Sadahiro; Yasue, Toshikazu; and Ejiri, Masakazu, 4,136,957, Cl. 356-394.000.

Elafuss, Inc.: *See—*
Dippold, William L., 4,136,548, Cl. 72-409.000.

Electro Switch Corp.: *See—*
MacLean, Alexander, 4,137,439, Cl. 200-153.00L.

Electrochemische Energieconversie N.V.: *See—*
Blanchart, Alain P. O.; Spaepen, Gustaaf J. F.; and De Brandt, Constantine W. M. V. A., 4,137,371, Cl. 429-29.000.

Electronics Corporation of America: *See—*
Cade, Phillip J., 4,137,035, Cl. 431-78.000.

El-Hindi, Ahmad M., to Filter Tech, Inc. Liquid filtration system. 4,137,169, Cl. 210-97.000.

Elliott, Michael; Janes, Norman F.; and Pulman, David A., to National Research Development Corporation. Optionally substituted phenyl-α-cyclopropyl acetic acid esters and use as insecticides. 4,137,324, Cl. 424-282.000.

Elliott, Robert L.: *See—*
Gardiner, John B.; Zielinski, James; Elliott, Robert L.; and Brois, Stanley J., 4,137,185, Cl. 252-33.000.

Elliott, William T., to Berger, Jenson & Nicholson Limited. Coating composition. 4,137,208, Cl. 260-29.6RB.

Ellison, Kenneth; and Whike, Alan S., to B & K Machinery International Ltd. Solvent vapor collector. 4,136,636, Cl. 118-68.000.

Elmeg-Elektro-Mechanik Gesellschaft mit beschrankter Haftung: *See—*
Reuting, Hans-Werner, 4,137,559, Cl. 361-331.000.

Emery, Loring D., Jr.: *See—*
Abraham, Bruce C.; Emery, Loring D., Jr.; Griesemer, Harold A.; and Stroup, Robert H., 4,136,765, Cl. 198-381.000.

EMI Limited: *See—*
Fetter, Richard W., 4,137,455, Cl. 250-445.00T.

Emmett, John C.: *See—*
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,137,234, Cl. 260-302.00R.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,137,237, Cl. 260-308.00R.

Emmons, Roger D., to UOP Inc. Plastic thermoset laminates. 4,137,357, Cl. 428-245.000.

Endicott, David W., Jr.; Denton, Charles L.; and Levinthal, Michael L., to Thiokol Corporation. Process for separation of nitroglycerin from mixtures with diethylene glycol. 4,137,255, Cl. 260-467.000.

Endo, Akira; Terahara, Akira; Kitano, Noritoshi; Ogiso, Akira; and Mitsui, Seiji, to Sankyo Company Limited. ML-236B carboxylic acid derivatives and their use as antihyperlipemic agents. 4,137,322, Cl. 424-273.00R.

Energy Conversion Devices, Inc.: *See—*
Izu, Masatsuga; and Ovshinsky, Stanford R., 4,137,078, Cl. 96-27.00E.

Engel, Wolfhard: *See—*
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; Haarmann, Walter; and Engelhardt, Gunther, 4,137,313, Cl. 424-246.000.

Engelhardt, Gunther: *See—*
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; Haarmann, Walter; and Engelhardt, Gunther, 4,137,313, Cl. 424-246.000.

Engelmann, Gottfried; and Christoph, Guenter, to Siemens Aktiengesellschaft. Paper transport device. 4,136,809, Cl. 226-79.000.

England, David C.: *See—*
Stiles, Alvin B.; and England, David C., 4,137,271, Cl. 260-604.00R.

Engler, Joseph P.: *See—*
Shoemaker, Charles T.; and Engler, Joseph P., 4,137,356, Cl. 428-211.000.

Enker, Stanley H.: *See—*
Broadwin, Alan; Weiss, Steven N.; and Enker, Stanley H., 4,136,700, Cl. 128-305.000.

Enomoto, Hiroshi: *See—*
Murai, Hiromu; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, 4,137,231, Cl. 546-242.000.

Erickson, James A.; and Erickson, John W., to Boltswitch, Inc. Bolted pressure switch with side operator mechanism and door assembly interlock. 4,137,433, Cl. 200-50.00A.

Erickson, John W.: *See—*
Erickson, James A.; and Erickson, John W., 4,137,433, Cl. 200-50.00A.

Ernest, Robert P., to Ford Motor Company. Low weight reciprocating engine. 4,136,648, Cl. 123-55.0VE.

Ernst Leitz Wetzlar GmbH: *See—*
Lisfeld, Robert, 4,136,927, Cl. 350-87.000.

Esaki, Leo: *See—*
Chang, Leroy L.; and Esaki, Leo, 4,137,542, Cl. 357-16.000.

Esanu, Andre, to Societe d'Etudes de Produits Chimiques. Anti-depressive vincamine pyridoxal-5-phosphate. 4,137,316, Cl. 424-256.000.

Escher, William J. D. Multimode solar energy collector and process. 4,136,673, Cl. 126-271.000.

Escher Wyss GmbH: *See—*
Bubik, Alfred; and Schultz, Hans-Joachim, 4,137,124, Cl. 162-343.000.

Escher Wyss Limited: *See—*
Lehmann, Rolf, 4,136,546, Cl. 72-241.000.

Esco S.A.: *See—*
von Allmen, Pierre, 4,136,489, Cl. 51-98.0BS.

Esner, Mark E., to Howard Wall Limited. Anchoring devices for vehicle safety belts and harnesses. 4,136,425, Cl. 24-230.00A.

Essex International, Inc.: *See—*
Grebik, Stephen J., 4,136,922, Cl. 339-223.00S.

Ethyl Corporation: *See—*
Walter, Thomas J., 4,137,260, Cl. 562-580.000.

Etnaer, Alexandr I.: *See—*
Suslin, Vladimir I.; Makeev, Boris A.; Dubovik, Alexandr I.; Lekarev, Zinovy A.; Pilipenko, Vitaly A.; Etnaer, Alexandr I.; Kolesnichenko, Anatoly A.; and Razdymakha, Pavel S., 4,137,143, Cl. 204-224.00M.

Ettinger, Donald H., to USM Corporation. Stud receiver. 4,137,445, Cl. 219-98.000.

Europe Container Terminus B.V.: *See—*
Wormmeester, Gerhardus J.; and Rijsenbrij, Joannes C., 4,136,619, Cl. 104-244.100.

Evans, Anthony G.: *See—*
Cox, David A.; Barnish, Ian T.; and Evans, Anthony G., 4,137,328, Cl. 424-324.000.

Ewig, John F., Jr.; and Gardner, Jon S., to Parker Manufacturing Company. Riveter. 4,136,547, Cl. 72-391.000.

Ex-Cell-O Corporation: *See—*
Wunder, William G., 4,136,488, Cl. 51-58.000.

Extranuclear Laboratories, Inc.: *See—*
Siegel, Melvin W., 4,137,453, Cl. 250-382.000.

Exxon Production Research Company: *See—*
Homer, Joseph F.; Glaeser, John L.; and Bright, Robert P., 4,136,633, Cl. 114-264.000.
Salathiel, William M.; and Shaughnessy, Christopher M., 4,136,739, Cl. 166-300.000.

Exxon Research & Engineering Co.: *See—*
Allan, David E.; Lewis, William E.; and Metrailer, William J., 4,137,149, Cl. 208-93.000.
Baker, Richard H., 4,137,570, Cl. 363-43.000.
Bartley, George S.; and Brunner, Stanley N., 4,137,491, Cl. 318-685.000.
Gardiner, John B.; Zielinski, James; Elliott, Robert L.; and Brois, Stanley J., 4,137,185, Cl. 252-33.000.
Makowski, Henry S.; Brenner, Douglas; and Bock, Jan, 4,137,203, Cl. 260-23.50A.

Eylon, Daniel: *See—*
Fujishiro, Shiro; and Eylon, Daniel, 4,137,370, Cl. 428-660.000.

Ezoe, Mitsuhiko: *See—*
Suzuki, Suzuo; Kawamura, Yoshihisa; and Ezoe, Mitsuhiko, 4,136,564, Cl. 73-194.00F.

F.A.T.A. - Fabbrica Apparecchi di Sollevamento e Trasporto Ed Affini S.p.A.: *See—*
Di Rosa, Gaetano, 4,136,749, Cl. 177-25.000.

F. C. Haab Co., Inc.: *See—*
Gramlich, Lawrence R., 4,136,541, Cl. 70-231.000.

F. L. Smithe Machine Company, Inc.: *See—*
Helm, Herbert W.; and Ziegler, Dennis, 4,136,591, Cl. 83-355.000.

Fabricant, Norman; and Moustakas, Matthew A., to CBS Inc. Puzzle pull toy. 4,136,480, Cl. 46-17.000.

Fael S.A.: *See—*
Schalch, Fred, 4,137,444, Cl. 219-81.000.

Fahn, Rudolf: *See—*
Buckl, Hans; and Fahn, Rudolf, 4,137,395, Cl. 536-1.000.

Fahrback, Erich: *See—*
Schmidt, Klaus; Hoffmann, Harald; and Fahrback, Erich, 4,137,379, Cl. 429-254.000.

Fairfield Manufacturing Co., Inc.: *See—*
Boor, Francis H., 4,136,582, Cl. 74-710.000.

Falce, Louis R.: *See—*
Caryotakis, George; Chan, George; Falce, Louis R.; Luebke, William R., deceased; and Wood, Walter, 4,137,482, Cl. 315-3.500.

Falivene, Pasquale J., to Colgate Palmolive Company. Process for the manufacture of fabric conditioning article. 4,137,345, Cl. 427-242.000.

Fanti, Hansruedi, to Matra AG. Furniture frame. 4,136,411, Cl. 5-191.000.

Farallon Industries, Inc.: *See—*
Shamlian, Ralph B., 4,136,689, Cl. 128-147.000.

Farge, Daniel; Le Goff, Yves; and Poiget, Gilbert, to Rhone-Poulenc Industries. Derivatives of 10-nitro-7-oxo-7H-indolizino[7,6,5-de]isoquinoline. 4,137,315, Cl. 424-248.560.

Fariello, Leonard A. Fabric comprising a novel type of netting. 4,137,353, Cl. 428-112.000.

Farmer, Larry B., to Milliken Research Corporation. Polymeric anthraquinone derived colorants. 4,137,243, Cl. 260-378.000.

Farrar, Ralph C.: *See—*
Smith, Richard L.; and Farrar, Ralph C., 4,137,391, Cl. 526-178.000.

Favennec, Pierre N.: *See—*
Henry, Loic G.; and Favennec, Pierre N., 4,137,141, Cl. 204-192.0EC.

Fecker, Josef; and Memminger, Gustav, to Gustav Memminger Verfahrenstechnik fur die Maschenindustrie. Positive tape feed with multiple yarn windings. 4,136,837, Cl. 242-47.010.

Federico, Joseph; Knight, Stephen; and Waaben, Sigurd G., to Bell Telephone Laboratories, Incorporated. Optically actuated bidirectional semiconductor switch. 4,137,428, Cl. 179-1.0SW.

Fedor, Joseph J. Mounting for wall aquarium. 4,136,638, Cl. 119-5.000.

Feld, Raoul: *See—*
Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, 4,137,297, Cl. 423-561.00R.

Feldmuhle Aktiengesellschaft: *See—*
Schmidt, Hugo, 4,136,604, Cl. 93-36.00A.

Felter, John V. Apparatus and methods for controlling fan operation. 4,136,822, Cl. 236-49.000.

Ferrario, Bruno: *See—*
della Porta, Paolo; Ferrario, Bruno; and Rosai, Livio, 4,137,012, Cl. 417-51.000.

Ferris, Ray L.: *See—*
Schuller, James J.; Raksanyi, William; and Ferris, Ray L., 4,136,621, Cl. 105-308.00E.

Ferroglio, Luigino; and Ratti, Umberto, to Ing. C. Olivetti & C., S.p.A. Bialphabetic teleprinter for texts in latin and arabic characters. 4,137,425, Cl. 178-30.000.

Fetter, Richard W., to EMI Limited. Medical radiographic apparatus with means for notating detector ring. 4,137,455, Cl. 250-445.00T.

Fettig, Lyle A., to Data View, Inc. Microfilm reader. 4,136,937, Cl. 353-27.00R.

Fiala, Ludvik: *See—*
Novotny, Pavel; and Fiala, Ludvik, 4,136,642, Cl. 122-4.00D.

Fiat-Allis Construction Machinery, Inc.: *See—*
Poore, Wesley A.; Randolph, Edward F.; and Rockwell, Harvey W., 4,136,751, Cl. 180-70.00R.

Field, Harry; Smith, Monte L.; Whitehead, Jas. A.; and Learn, Monroe E., to Newcor, Inc. Hydraulic cycloidal drive. 4,136,519, Cl. 60-369.000.

Field, Richard L., to United States of America, Navy. Solar energy window. 4,137,098, Cl. 136-89.0PC.

Filin, Vladimir A.: *See—*
Varlamov, Vladimir M.; Sopin, Anatoly I.; Judaev, Vasily F.; Romanov, Jury P.; Kokarev, Dmitry T.; Metelyagin, Alexandr Z.; Shestakov, Vladislav A.; Fomin, Vladimir I.; and Filin, Vladimir A., 4,136,971, Cl. 366-169.000.

Film Cassette Inc.: *See—*
Gourley, Dennis R., 4,136,843, Cl. 242-198.000.

Filter Tech, Inc.: *See—*
El-Hindi, Ahmad M., 4,137,169, Cl. 210-97.000.

Findeisen, Kurt: *See—*
Braden, Rudolf; and Findeisen, Kurt, 4,137,412, Cl. 544-334.000.

Finegold, Hyman B.: *See—*
Copeland, Francis E.; Bucholtz, Glen E.; and Finegold, Hyman B., 4,136,433, Cl. 29-564.600.

Finelli, Anthony F.; and Hutchins, Thomas G., to Goodyear Tire &

Rubber Company, The. Accelerator for curing chlorinated ethylenically unsaturated polymers. 4,137,384, Cl. 526-35.000.

Firestone Tire & Rubber Company, The: *See—*
Prichard, Mark S.; Hilton, Ashley S.; Stayer, Mark L., Jr.; and Antkowiak, Thomas A., 4,137,330, Cl. 423-300.000.

Firnhaber, Miles. Nickel-chromium alloys. 4,137,074, Cl. 75-134.00C.

Fischer, Artur. Mating plate and axle element, with undercut connector. 4,136,482, Cl. 46-23.000.

Fischer, Franz; and Helbig, Joachim, to Verla-Pharm Arzneimittelfabrik, Apotheker H.J.V. Ehrlich. Use of magnesium monospartate hydrochloride complex. 4,137,326, Cl. 424-319.000.

Fish, Daniel C. E. Portable dams. 4,136,995, Cl. 405-115.000.

Fiske, Kenton W.: *See—*
Mager, George E.; Nelson, Frank M.; Gillett, Kenneth; Holt, Charles P.; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; Criswell, Thomas; and Hall, Warren L., 4,137,565, Cl. 364-200.000.

Fitzsimmons, Thomas W.; Berluti, Vincent, Jr.; Wagner, Howard G.; and Shapiro, Jonathan S., to Machlett Laboratories, Inc., The. Radiographic system. 4,137,460, Cl. 250-511.000.

Flautt, Martin C.: *See—*
Wong, Robert; and Flautt, Martin C., 4,137,209, Cl. 260-29.6NR.

Fletcher, Lawrence J., to Gomaco Corporation. Apparatus for forming keyway joints. 4,136,993, Cl. 404-88.000.

Flex-O-Lators, Inc.: *See—*
Vandenbark, Thomas E.; and Patrick, John H., 4,136,410, Cl. 5-190.000.

Flis, Richard J.: *See—*
Smilgys, Bruno S.; Flis, Richard J.; and Devanney, Raymond H., 4,136,573, Cl. 74-348.000.

Flockencier, Stuart W.: *See—*
O'Rourke, John D.; and Flockencier, Stuart W., 4,136,467, Cl. 35-25.000.

Flower, David M., to Economics Laboratory, Inc. Method of washing. 4,137,044, Cl. 8-137.000.

Fluid Controls, Inc.: *See—*
Merkel, Stephen F., 4,136,753, Cl. 180-133.000.

FMC Corporation: *See—*
Derner, William J., 4,136,915, Cl. 308-201.000.
Sako, Fumio F.; and Pearson, Christopher C., 4,137,172, Cl. 210-150.000.
Slattery, Gerald H.; and Seglin, Leonard, 4,137,256, Cl. 260-502.00A.

FMN Schuster & Company: *See—*
Tschentscher, Alfred, 4,136,834, Cl. 242-18.0PW.

Fohl, Artur, to Repa Feinstanzwerk GmbH. Automatic roll-up device for safety belts in motor vehicles. 4,136,841, Cl. 242-107.000.

Folk, Kenneth F.: *See—*
Brandewie, Joseph E.; Folk, Kenneth F.; and Ross, Milton D., 4,136,440, Cl. 29-628.000.

Folsom, Terrance R. Stove. 4,136,664, Cl. 126-64.000.

Fomin, Vladimir I.: *See—*
Varlamov, Vladimir M.; Sopin, Anatoly I.; Judaev, Vasily F.; Romanov, Jury P.; Kokarev, Dmitry T.; Metelyagin, Alexandr Z.; Shestakov, Vladislav A.; Fomin, Vladimir I.; and Filin, Vladimir A., 4,136,971, Cl. 366-169.000.

Fonteneau, Norman O.: *See—*
Haas, Steven L.; Fonteneau, Norman O.; Sullivan, Paul F.; Hottel, Hoyt C., Jr.; Brown, Robert A.; Gobush, William; Jepson, John W.; and Lynch, Francis deS., 4,137,566, Cl. 364-410.000.

Ford, Michael E.: *See—*
Dixon, Dale D.; and Ford, Michael E., 4,137,280, Cl. 260-873.000.

Ford Motor Company: *See—*
Boaz, Premakaran T., 4,137,447, Cl. 219-522.000.
Ernest, Robert P., 4,136,648, Cl. 123-55.0VE.
Mrdjenovich, Robert, 4,137,071, Cl. 75-30.000.
Nordstrom, John D.; and Peng, Stephen C., 4,137,277, Cl. 260-835.000.

Fordyce, Ian: *See—*
Crompton, Eric J.; Poissant, Serge; and Fordyce, Ian, 4,137,426, Cl. 178-46.000.

Forseth, Glenn J., to Phillips Petroleum Company. Carbon black pelleter. 4,136,975, Cl. 366-325.000.

Forster, Hilmar; and Gunther, Wilhelm, to Scharfenbergkupplung GmbH. Elastic hinge of a central buffer coupling for rail cars. 4,136,787, Cl. 213-40.00R.

Fountain, Edgar A., to General Motors Corporation. Cutter blade. 4,137,001, Cl. 407-115.000.

Fournier, Erick-Pierre; and Hill, Ethel V. Can opener. 4,136,448, Cl. 30-450.000.

Fowler, Steven E., to United States of America, Navy. Electronic delay detonator. 4,136,617, Cl. 102-220.000.

Foxboro Company, The: *See—*
Doyle, Nicholas E., Jr., 4,136,603, Cl. 92-98.00R.

Franck, Jean-Pierre; Freund, Edouard; Marcilly, Christian; and Miquel, Jean, to Institut Francais du Petrole. Process for manufacturing olefinic hydrocarbons with respectively two and three carbon atoms per molecule. 4,137,147, Cl. 208-61.000.

Francois Golay S.A.: *See—*
Briand, Pierre; and Berney, Remy, 4,136,451, Cl. 33-141.00E.

Franklin, Alfred A., Jr.; and McLeod, Ian C., to Microlife Technics, Inc. Method and compositions for inoculating leguminosae with bacteria. 4,136,486, Cl. 47-58.000.

Fraser, Ian K. Sail batten. 4,136,630, Cl. 114-102.000.

Frasher, Gary J. Door brace. 4,136,899, Cl. 292-338.000.

Frederick, Charles V. Wall panel. 4,136,495, Cl. 52-251.000.

Frederick, Henry E.: *See—*
Scheier, Donald J.; and Frederick, Henry E., 4,136,421, Cl. 17-52.000.

Freitag, Dieter: *See—*
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,137,219, Cl. 528-177.000.

Frenkel C-D Aktiengesellschaft: *See—*
Meyer, Paul, 4,136,969, Cl. 366-88.000.

Freund, Edouard: *See—*
Franck, Jean-Pierre; Freund, Edouard; Marcilly, Christian; and Miquel, Jean, 4,137,147, Cl. 208-61.000.

Fridhill, Nils T. Method for delining a furnace or the like. 4,136,430, Cl. 29-427.000.

Friesen, Larry D.; and Palmer, Stephen L., to Towmotor Corporation. Vehicle brake control system. 4,136,752, Cl. 180-101.000.

Frisch, Kurt C.: *See—*
Wood, Louis L.; and Frisch, Kurt C., 4,137,200, Cl. 521-159.000.

Fritts, David H., to United States of America, Air Force. Method for state of charge of primary battery. 4,137,374, Cl. 429-50.000.

Frolichsthal, Herbert. Manure disposer installation. 4,136,571, Cl. 74-89.150.

Fruchtnicht, Ocke C.: *See—*
Clodfelter, Glen A.; and Fruchtnicht, Ocke C., 4,137,351, Cl. 428-36.000.

Frusco, John M., to Plessey Incorporated. Stamped lead frame for semiconductor packages. 4,137,546, Cl. 357-70.000.

Fryen, Jurgen: *See—*
Boeck, Joachim; Dunker, Peter; Fryen, Jurgen; Neumann, Dietrich; Pattberg, Georg; and Wieseke, Udo, 4,137,562, Cl. 364-200.000.

Fryer, Rodney I.: *See—*
Walser, Armin; and Fryer, Rodney I., 4,137,229, Cl. 260-239.30T.

Fuchs, Gundolf; and Pirck, Dietrich, to Deutsche Texaco Aktiengesellschaft. Process for the production of resins containing hydroxyl groups. 4,137,207, Cl. 260-29.60T.

Fuji Photo Film Co., Ltd.: *See—*
Sera, Hidefumi; Ishii, Tsumoru; Yamaguchi, June; and Shiraishi, Hisashi, 4,137,082, Cl. 96-111.000.

Fujii, Tadashiro: *See—*
Tsuchihashi, Genichi; Ogura, Katsuyuki; Yaso, Masao; Kuramoto, Masashi; Fujii, Tadashiro; and Watanabe, Tetsuo, 4,137,406, Cl. 544-27.000.

Fujii, Yasuhiko: *See—*
Haramoto, Yutaka; Fujii, Yasuhiko; and Yamazaki, Masami, 4,137,507, Cl. 330-302.000.

Fujii, Yoshio: *See—*
Shimada, Mitsuo; and Fujii, Yoshio, 4,137,161, Cl. 210-31.00C.

Fujino, Hisaaki: *See—*
Kanamaru, Naokatu; Imai, Kazuo; and Fujino, Hisaaki, 4,137,113, Cl. 156-187.000.

Fujishiro, Shiro; and Eylon, Daniel, to United States of America, Air Force. Titanium and titanium alloys ion plated with noble metals and their alloys. 4,137,370, Cl. 428-660.000.

Fujita, Manabu: *See—*
Sakurai, Akira; and Fujita, Manabu, 4,137,196, Cl. 252-522.000.

Fujita, Tadashi; Oya, Masayuki; Takashina, Hideo; and Iso, Tadashi, to Santen Pharmaceutical Co., Ltd. Cysteine derivatives. 4,137,420, Cl. 562-426.000.

Fujitsu Limited: *See—*
Ihara, Masaru; and Jifuku, Masayuki, 4,137,108, Cl. 148-175.000.
Takahashi, Hideo; Aikawa, Kazuhisa; and Horie, Masakatsu, 4,137,537, Cl. 346-159.000.

Fujiwara, Hiroshi: *See—*
Machi, Sueo; Sugo, Takanobu; Sugishita, Akio; Kanai, Sakunobu; and Fujiwara, Hiroshi, 4,137,137, Cl. 204-159.160.

Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Kaneko, Yutaka; and Masukawa, Toyoaki, to Konishiroku Photo Industry Co., Ltd. Process for dye image production on a light-sensitive silver halide photographic material. 4,137,080, Cl. 96-55.000.

Fuller, Richard B. Floating breakwater. 4,136,994, Cl. 405-27.000.

Funakoshi, Satoshi; Omura, Takao; and Ohshiro, Takeshi, to Green Cross Corporation, The. Process for preparing haptoglobin aqueous solution using strong anion exchanger. 4,137,307, Cl. 424-177.000.

Furst, Andor: *See—*
Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; Kieslich, Klaus; and Wiechert, Rudolf, 4,137,269, Cl. 260-586.00E.

G. D. Searle & Co.: *See—*
Kukla, Michael J., 4,137,414, Cl. 544-376.000.

G. Lufft Metallbarometerfabrik GmbH & Co.: *See—*
Pott, Otto F., 4,136,550, Cl. 73-1.00G.

GAF Corporation: *See—*
Brodsky, Lee D.; Moskowitz, Mark L.; and Moore, Ralph G. D., 4,137,226, Cl. 260-140.000.
Brown, Michael J.; Resnick, Bruce M.; and Woodland, James H. R., 4,137,332, Cl. 424-326.000.
Chakrabarti, Paritosh M.; and Grifo, Richard A., 4,137,190, Cl. 252-135.000.

Gaffar, Abdul; and Volpe, Anthony R., to Colgate Palmolive Company. Antibacterial oral composition. 4,137,303, Cl. 424-52.000.

Gaillot, Jean-Paul; and Kirch, Bernard P., to Pont-a-Mousson S.A. Fire-resisting device for piping extending through a wall. 4,136,707, Cl. 137-75.000.

Gale, Glen R.; and Schwartz, Paul, to United States of America, Health, Education and Welfare. Compound, 4-carboxyphthalato(1,2-diaminocyclohexane)-platinum(II) and alkali metal salts thereof. 4,137,248, Cl. 260-429.00R.

Gallant, Stuart L.: *See*—
Cosentino, Louis C.; and Gallant, Stuart L., 4,136,708, Cl. 137-99.000.
Ganellin, Charon R.: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,137,234, Cl. 260-302.00R.
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,137,237, Cl. 260-308.00R.
Durant, Graham J.; and Ganellin, Charon R., 4,137,319, Cl. 424-263.000.
Garcea, Giampaolo, to Alfa Romeo S.p.A. Potentiometric regulator of a physical magnitude which is a function whatever of other two magnitudes. 4,137,517, Cl. 338-118.000.
Gardiner, John B.; Zielinski, James; Elliott, Robert L.; and Brois, Stanley J., to Exxon Research & Engineering Co. Stabilized imide graft of ethylene copolymeric additives for lubricants. 4,137,185, Cl. 252-33.000.
Gardner, Jeffrey M., to Container Corporation of America. Convertible partition arrangement. 4,136,815, Cl. 229-15.000.
Gardner, Jeffrey M., to Container Corporation of America. Self locking container. 4,136,816, Cl. 229-33.000.
Gardner, Jon S.: *See*—
Ewig, John F., Jr.; and Gardner, Jon S., 4,136,547, Cl. 72-391.000.
Garmaise, David L.: *See*—
Paris, Gerald Y.; Cimon, Denis G.; and Garmaise, David L., 4,137,317, Cl. 424-256.000.
Gasser, Max, to Max Gasser AGF Produktion. Sighting device for bow. 4,136,461, Cl. 33-265.000.
Gates, Marvin A., to Caterpillar Tractor Co. Speed sensitive pressure regulator system. 4,136,658, Cl. 123-140.0MC.
Gates, Raymond D.: *See*—
Rubin, Sol R.; and Gates, Raymond D., 4,136,711, Cl. 137-414.000.
Gates Rubber Company, The: *See*—
McClelland, Donald H., 4,137,377, Cl. 429-145.000.
Gatzi, Karl, to Ciba-Geigy Corporation. Pyridine-4-carboxylic acid hydrazides for combatting phytopathogenic microorganisms and for regulating plant growth. 4,137,067, Cl. 71-94.000.
Gaughan, Edmund J., to Stauffer Chemical Company. Sulfoxide and sulfone thiazolidines, compositions thereof and their utility as herbicide antidotes. 4,137,066, Cl. 71-91.000.
Gawrilow, Ilija, to SCM Corporation. Stable fluent emulsifier concentrate containing solid phase emulsifier components. 4,137,338, Cl. 426-601.000.
Gdulla, Manfred: *See*—
Walther, Hans J.; and Gdulla, Manfred, 4,136,403, Cl. 2-10.000.
Gebr. Poensgen & Sulzmann GmbH, Firma: *See*—
Harrsch, Ernst, 4,136,537, Cl. 68-13.00R.
Gellos, Alexander T. Pressure gauge. 4,136,560, Cl. 73-146.800.
General Battery Corporation: *See*—
Nees, John; and Bailey, Dale A., 4,137,378, Cl. 429-245.000.
General Binding Corporation: *See*—
Staats, Henry N., 4,137,289, Cl. 264-138.000.
General Cable Corporation: *See*—
Huang, Yung-Yien; Olszewski, Jerzy A.; and Sarkar, Arnab, 4,136,960, Cl. 356-239.000.
General Dynamics Corporation: *See*—
Maudal, Inge, 4,136,844, Cl. 244-3.200.
General Electric Company: *See*—
Barkan, Philip; and Barton, Robert S., 4,137,436, Cl. 200-153.0SC.
Brown, Harold, 4,136,517, Cl. 60-223.000.
Corsmeier, Robert J., 4,136,516, Cl. 60-39.09R.
Donaghy, Robert E., 4,137,131, Cl. 204-32.00R.
Godwin, Stanley J., 4,137,051, Cl. 48-66.000.
Lewis, Walter E., 4,136,667, Cl. 126-197.000.
Li, Ming K.; and MacLaury, Michael R., 4,137,421, Cl. 568-725.000.
Lipo, Thomas A., 4,137,489, Cl. 318-798.000.
McCarty, William J., 4,136,529, Cl. 62-280.000.
Osteen, Mitchell M., 4,137,484, Cl. 315-209.00R.
Sun, Yen S. E., 4,137,099, Cl. 148-1.500.
Wright, Lonnie C.; and Billings, David L., 4,137,514, Cl. 335-220.000.
General Industries, Inc.: *See*—
Grenier, Wilfred J., 4,136,852, Cl. 251-189.000.
General Motors Corporation: *See*—
Barker, Edison D.; and Cook, John A., 4,137,002, Cl. 408-59.000.
Brucken, Byron L., 4,137,018, Cl. 417-440.000.
Fountain, Edgar A., 4,137,001, Cl. 407-115.000.
Sagady, Daniel V., 4,136,982, Cl. 403-108.000.
Gengnagel, Kurt: *See*—
Papenfuhs, Theodor; and Gengnagel, Kurt, 4,137,272, Cl. 568-628.000.
Georg Spiess GmbH: *See*—
Marass, Josef, 4,136,865, Cl. 271-270.000.
Gernez, Alain: *See*—
Lasne, Claude; and Gernez, Alain, 4,137,344, Cl. 427-156.000.
Gerstl, Rudolf, to Veitscher Magnesitwerke-Actien-Gesellschaft; and Oesterreichisch-Amerikanische Magnesit Aktiengesellschaft. Brick-making press. 4,137,026, Cl. 425-78.000.
Gertsik, Efim M.: *See*—
Nabiullin, Faat K.; Gertsik, Efim M.; Rabinovich, Vyacheslav A.; Soldatenko, Vladimir A.; and Rodionov, Jury T., 4,136,443, Cl. 29-731.000.
Ghoshal, Ramkrishna, to Rexnord Inc. Rock bolt resins. 4,136,774, Cl. 206-219.000.
Gillespie, Bernard M.; Sarli, Michael S.; and Smith, Kenneth W., to Mobil Oil Corporation. Manufacture of specialty oils. 4,137,148, Cl. 208-87.000.
Gillett, Kenneth: *See*—
Mager, George E.; Nelson, Frank M.; Gillett, Kenneth; Holt, Charles P.; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; Criswell, Thomas; and Hall, Warren L., 4,137,565, Cl. 364-200.000.
Gillette, Timothy C., to ARP Instruments, Inc. Single bus keyboard. 4,136,595, Cl. 84-1.010.
Gillham, Robert E., Sr. Coring apparatus. 4,136,447, Cl. 30-287.000.
Gilliams, Yvan K.: *See*—
Verlinden, Willy G.; Gilliams, Yvan K.; and Stievenart, Emile F., 4,137,340, Cl. 427-16.000.
Gilman, Richard L. Protective mat and method of making same. 4,137,348, Cl. 428-33.000.
Gioia, Norman F.: *See*—
Torre, Alton J.; Retsky, Michael W.; Gioia, Norman F.; and Amin, Ramesh G., 4,137,480, Cl. 313-481.000.
Girault, Pierre: *See*—
Perronnet, Jacques; Demoute, Jean-Pierre; Girault, Pierre; and Teche, Andre, 4,137,068, Cl. 71-98.000.
Givaudan Corporation: *See*—
Weber, Peter, 4,137,126, Cl. 195-66.00R.
Gladd, Andrew, Jr.: *See*—
Gladd, Andrew J.; Gladd, Andrew, Jr.; and MacKay, Ralph J., 4,136,608, Cl. 99-476.000.
Gladd, Andrew J.; Gladd, Andrew, Jr.; and MacKay, Ralph J., to Gladd Industries, Inc. System for processing meat. 4,136,608, Cl. 99-476.000.
Gladd Industries, Inc.: *See*—
Gladd, Andrew J.; Gladd, Andrew, Jr.; and MacKay, Ralph J., 4,136,608, Cl. 99-476.000.
Glaeser, John L.: *See*—
Homer, Joseph F.; Glaeser, John L.; and Bright, Robert P., 4,136,633, Cl. 114-264.000.
Glassman, Donald; and Rabbits, Marc T., to United States Steel Corporation. Process and apparatus for separating light oil from a mixture comprising waste oil. 4,137,135, Cl. 203-87.000.
Glatzel, Erhard, to Carl Zeiss Stiftung. High speed wide angle lens system. 4,136,931, Cl. 350-189.000.
Glavis, Frank L.; and Clemens, David H., to Rohm and Haas Company. Preparation, polymerization, and use of new bis-vinylbenzyl nitrogenous monomers. 4,137,264, Cl. 260-567.60M.
Glew, David N.; and Clarke, E. Colin W., to Dow Chemical Company, The. Production of chlorine dioxide. 4,137,296, Cl. 423-478.000.
Globe Tool and Engineering Company, The: *See*—
Copeland, Francis E.; Bucholtz, Glen E.; and Finegold, Hyman B., 4,136,433, Cl. 29-564.600.
Gneiting, Derrell A.; and Gneiting, John A. Heating unit. 4,136,663, Cl. 126-63.000.
Gneiting, John A.: *See*—
Gneiting, Derrell A.; and Gneiting, John A., 4,136,663, Cl. 126-63.000.
Gobush, William: *See*—
Haas, Steven L.; Fonteneau, Norman O.; Sullivan, Paul F.; Hottel, Hoyt C., Jr.; Brown, Robert A.; Gobush, William; Jepson, John W.; and Lynch, Francis deS., 4,137,566, Cl. 364-410.000.
Godsey, Randall D.; Svacha, Roy E.; Crawford, James V.; and Janowski, Kenneth R., to UOP Inc. Method for producing improved heat transfer surface. 4,136,428, Cl. 29-157.400.
Godwin, Stanley J., to General Electric Company. Grate for coal gasifier. 4,137,051, Cl. 48-66.000.
Goes, Friedrich, to Volkswagenwerk Aktiengesellschaft. Loudspeaker system for a vehicle. 4,136,755, Cl. 181-141.000.
Goff, Willie, Jr., to International Business Machines Corporation. Paper guide means for reverse feed sheet paper separation device. 4,136,861, Cl. 271-22.000.
Gofflot, Armand. Cattle squeeze gate. 4,136,640, Cl. 119-99.000.
Goldowsky, Michael. Flow meter administration device. 4,136,692, Cl. 128-214.00C.
Goldschmidt, Klaus: *See*—
Bassier, Friedrich-Karl; and Goldschmidt, Klaus, 4,136,998, Cl. 405-267.000.
Golinkin, Herbert S., to Standard Oil Company (Indiana). Process for fracturing well formations using aqueous gels. 4,137,182, Cl. 252-8.55R.
Golovko, Georgy A. Process for low-temperature separation of air. 4,137,056, Cl. 62-13.000.
Golovnya, Vitaly G.: *See*—
Vorobeichikov, Leonid T.; and Golovnya, Vitaly G., 4,137,038, Cl. 432-77.000.
Gomaco Corporation: *See*—
Fletcher, Lawrence J., 4,136,993, Cl. 404-88.000.
Gomm, Thiel; and Price, Stephen E., to Coca-Cola Company, The. Method and apparatus for detecting foreign particles in full beverage containers. 4,136,930, Cl. 358-106.000.
Gony, Jean-Noel: *See*—
Clin, Francois; Gony, Jean-Noel; and Proust, Francois, 4,137,155, Cl. 209-134.000.
Goodfellow, Anthony G., to Dunlop Limited. Manufacture of pneumatic tires. 4,137,033, Cl. 425-542.000.
Goodnight, Roy G. Vertical antenna with low angle of radiation. 4,137,534, Cl. 343-752.000.
Goodyear Tire & Rubber Company, The: *See*—
Finelli, Anthony F.; and Hutchins, Thomas G., 4,137,384, Cl. 526-35.000.

Gross, Bill B., 4,137,392, Cl. 526-224.000.
Ofstead, Eilert A., 4,137,390, Cl. 526-143.000.

Gorbulev, Efim S.: *See—*
Ignatiev, Alexei K.; Nemets, Rusaam S.; Gorbulev, Efim S.; Stolyarova, Elena N.; and Kontsov, Jury M., 4,136,718, Cl. 140-105.000.

Gordon Johnson Company: *See—*
Scheier, Donald J.; and Frederick, Henry E., 4,136,421, Cl. 17-52.000.

Gordon, Robert T. Intracellular temperature measurement. 4,136,683, Cl. 128-2.00H.

Gorin, Everett: *See—*
Zielke, Clyde W.; and Gorin, Everett, 4,137,298, Cl. 423-648.00R.

Gorman, Anthony G., to Racal-Amplivox Communications Ltd. Protective devices. 4,136,688, Cl. 128-142.700.

Gorman, Richard L.: *See—*
Hetrick, George, 4,136,476, Cl. 42-1.0LP.

Gorodissky, Leonid G.; Vasilieva, Raisa V.; Kozlov, Mikhail D.; Romanov, Nikolai T., deceased; and by Romanova, Anastasia I., administrator. Hermetic seal of a chamber for treatment of bandlike material at an excess pressure. 4,136,536, Cl. 68-5.00E.

Gorynin, Igor V.: *See—*
Barbashin, Oleg A.; Okunev, Alexandr A.; Mikhailov, Sergei K.; Mochalov, Lev E.; Orlov, Lev P.; Shenderov, Lev B.; Shelepov, Nikolai S.; Dubodin, Vissarion M.; Vladimirov, Alexandr S.; and Gorynin, Igor V., 4,137,422, Cl. 13-9.00R.

Gosudarstvenny Vsesojuzny Institut po Proektirovaniju i Nauchno-Issledovatelskim rabotam "JUZHGIPROTSEMENT": *See—*
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Goto, Takeshi: *See—*
Kawakami, Noboru; Goto, Takeshi; Hirano, Itsuo; and Itakura, Yoichi, 4,137,072, Cl. 75-58.000.

Gourley, Dennis R., to Film Cassette Inc. Tape cassette having reel locking means therein. 4,136,843, Cl. 242-198.000.

Grachev, Andrei N.: *See—*
Khokhulin, Vladimir N.; Grachev, Andrei N.; Shver, Valery G.; and Kozlov, Valentin L., 4,136,487, Cl. 51-33.00R.

Graff, Hart F.; Kohler, John B.; Parks, Noel W.; Pierson, Marvin B.; Schnedler, Paul E.; and Strait, Richard E., to Armco Steel Corporation. Metallic coating method. 4,137,347, Cl. 427-349.000.

Graham, Glenn A., to Massachusetts Institute of Technology. Device to monitor movement of a surface. 4,136,556, Cl. 340-690.000.

Graham Magnetics Incorporated: *See—*
Deffeyes, Robert J.; and Johnson, Grover L., 4,137,361, Cl. 428-328.000.

Gramlich, Lawrence R., to F. C. Haab Co., Inc. Tamper proof locking device for fuel oil meters and the like. 4,136,541, Cl. 70-231.000.

Grant, James B.; and McCoubrey, George A., to United States of America, Navy. Adjustable blowing slot for circulation control airfoil. 4,137,008, Cl. 416-20.00R.

Grant, Stephen L., to Standard Oil Company (Ohio). Coal desulfurization. 4,137,050, Cl. 44-1.00R.

Grashow, Joseph; and Krom, Jan H., to Quick-Mount Manufacturing Company, Inc. Automobile antenna mount structure. 4,136,986, Cl. 403-197.000.

Graves, Kenneth E.; and Angelbeck, Peter. Apparatus for measuring and controlling the wall thickness of plastic pipes. 4,137,025, Cl. 425-71.000.

Great Circle Associates: *See—*
Mullerheim, Steven B.; and Williams, Fred G., Jr., 4,137,062, Cl. 71-9.000.

Grebik, Stephen J., to Essex International, Inc. Ignition cable terminals. 4,136,922, Cl. 339-223.00S.

Green Cross Corporation, The: *See—*
Funakoshi, Satoshi; Omura, Takao; and Ohshiro, Takeshi, 4,137,307, Cl. 424-177.000.

Green, David B.: *See—*
Asselman, George A. A.; Green, David B.; Castelijns, Adrianus P. J.; Naastepad, Pieter A.; and de Ruiter, Jacob W., 4,136,733, Cl. 165-32.000.

Greif Bros. Corporation: *See—*
Dubois, Robert A.; and Gushard, William H., 4,136,796, Cl. 220-256.000.

Grenier, Wilfred J., to General Industries, Inc. Expansible plug valve. 4,136,852, Cl. 251-189.000.

Griesemer, Harold A.: *See—*
Abraham, Bruce C.; Emery, Loring D., Jr.; Griesemer, Harold A.; and Stroup, Robert H., 4,136,765, Cl. 198-381.000.

Grifo, Richard A.: *See—*
Chakrabarti, Paritosh M.; and Grifo, Richard A., 4,137,190, Cl. 252-135.000.

Grigat, Ernst; and Hetzel, Hartmut, to Bayer Aktiengesellschaft. Screw machine for the continuous degradation of plastics. 4,136,967, Cl. 366-82.000.

Griswold, James M. Snow removal device. 4,136,418, Cl. 15-111.000.

Groos, Richard T.; and Sanders, Gerald W., to Viking Corporation, The. Large drop sprinkler head for high heat output fires. 4,136,740, Cl. 169-39.000.

Grosch, Gregory E. Form for pool decks. 4,136,850, Cl. 249-19.000.

Gross, Bill B., to Goodyear Tire & Rubber Company, The. Carboxylated vinyl pyrrolidone copolymers. 4,137,392, Cl. 526-224.000.

Grossman, William C. Energy conversion system using windmill. 4,137,015, Cl. 417-366.000.

Grubb, Daniel B., to AMP Incorporated. Pneumatically operated cable-slitting tool. 4,136,445, Cl. 30-90.100.

Grube, Hans J. System for passenger and luggage processing at commercial airports. 4,137,567, Cl. 364-567.000.

Grumman Aerospace Corporation: *See—*
Seymour, Herbert R., 4,136,568, Cl. 73-655.000.

Guadalupi, Mario; Zardi, Umberto; and Lagana, Vincenzo, to Snam Progetti S.p.A. Process for the production of urea. 4,137,262, Cl. 260-555.00A.

Guanella, Gustav, to Patelhold Patentverwertungs- & Holding AG. Method of and apparatus for frequency control. 4,137,505, Cl. 329-124.000.

Gudat, Wolfgang: *See—*
Hesse, Karl-Heinz; Ruhnau, Gerhard; Gudat, Wolfgang; and Liermann, Peter, 4,136,912, Cl. 303-91.000.

Guenther, Karl H. Combination doorhandle and safety locking device. 4,136,898, Cl. 292-57.000.

Guenther, Werner; Stueber, Franz; Muether, Manfred; and Kratochwilla, Hans-Michael, to Siemens Aktiengesellschaft. Hydraulic-pneumatic control device for controlling the flow of agents to hand-held dental apparatus. 4,136,450, Cl. 32-22.000.

Guile, Donald L.: *See—*
Anderson, Joseph W.; Guile, Donald L.; and Smith, Roy E., 4,136,828, Cl. 239-422.000.

Guinosso, Charles J.: *See—*
Sellstedt, John H.; Guinosso, Charles J.; Shriver, David A.; and Klaubert, Dieter H., 4,137,325, Cl. 424-311.000.

Gulbins, Erich: *See—*
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Gulf Research & Development Company: *See—*
Bacha, John D.; Onopchenko, Anatoli; and Schulz, Johann G. D., 4,137,419, Cl. 562-408.000.
Schulz, Johann G. D.; and Sabourin, Edward T., 4,137,418, Cl. 562-407.000.

Gulf & Western Industries, Inc.: *See—*
Ness, Martin E., 4,137,105, Cl. 148-11.50R.

Gunning, Raymond H.; Henshaw, Bruce C.; and Lubbock, Frederick J., to Dulux Australia Ltd. Polyester granules and process. 4,137,380, Cl. 521-62.000.

Gunther, Wilhelm: *See—*
Forster, Hilmar; and Gunther, Wilhelm, 4,136,787, Cl. 213-40.00R.

Gushard, William H.: *See—*
Dubois, Robert A.; and Gushard, William H., 4,136,796, Cl. 220-256.000.

Gustav Memminger Verfahrenstechnik fur die Maschenindustrie: *See—*
Fecker, Josef; and Memminger, Gustav, 4,136,837, Cl. 242-47.010.

Gustavsson, Gustav R. A.: *See—*
Claesson, Tore V.; and Gustavsson, Gustav R. A., 4,136,918, Cl. 339-31.00R.

Gustavsson, Stig I.: *See—*
Af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,137,225, Cl. 260-112.50R.

Gutman, Arnold D., to Stauffer Chemical Company. 1,3-Oxazole phosphates and phosphonates as insecticides and miticides. 4,137,308, Cl. 424-200.000.

Gynetech-Denver, Inc.: *See—*
Dafoe, Charles A., 4,136,695, Cl. 128-215.000.

H. B. Fuller Company: *See—*
Collins, James A.; and Quinn, Thomas H., 4,136,699, Cl. 128-290.00R.

Haag, Armin: *See—*
Kempter, Fritz E.; Gulbins, Erich; Haag, Armin; and Kroker, Ruprecht, 4,137,213, Cl. 260-39.00P.

Haarmann, Walter: *See—*
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; Haarmann, Walter; and Engelhardt, Gunther, 4,137,313, Cl. 424-246.000.

Haas, David L., to Sperry Rand Corporation. Hair roller. 4,136,706, Cl. 132-40.000.

Haas, Steven L.; Fonteneau, Norman O.; Sullivan, Paul F.; Hottel, Hoyt C., Jr.; Brown, Robert A.; Gobush, William; Jepson, John W.; and Lynch, Francis deS., to Acushnet Company. Apparatus and method for analyzing a golf swing and displaying results. 4,137,566, Cl. 364-410.000.

Haas, Werner E. L.: *See—*
Adams, James E.; Haas, Werner E. L.; and Dir, Gary A., 4,136,933, Cl. 350-341.000.

Haas, Willard A. Fireplace construction. 4,136,666, Cl. 126-143.000.

Habib, Joseph: *See—*
Rodman, Michael R.; Holmes, Paul M.; and Habib, Joseph, 4,136,896, Cl. 285-341.000.

Haga, Ryooichi: *See—*
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Hall, Warren L.: *See—*
Mager, George E.; Nelson, Frank M.; Gillett, Kenneth; Holt, Charles P.; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; Criswell, Thomas; and Hall, Warren L., 4,137,565, Cl. 364-200.000.

Hallanger, Lawrence W. Flat plate solar energy collector. 4,136,672, Cl. 126-271.000.

Haluch, David A., to Parker-Hannifin Corporation. Coupling device for tubular members. 4,136,897, Cl. 285-342.000.

Hamlet, Buck C.: *See—*
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,136,893, Cl. 280-678.000.

Hammer, Victor S., Jr., to Illinois Tool Works Inc. Plastic screw grommet. 4,136,599, Cl. 85-80.000.
Hammett, Daniel E.; and Smith, Edward M., to University of Kentucky Research Foundation, The. Ground driven power tillage device. 4,136,744, Cl. 172-60.000.
Hanaoka, Tetsuro: *See*—
Ichida, Takeshige; Hontani, Kunihiko; and Hanaoka, Tetsuro, 4,137,549, Cl. 358-13.000.
Handwerk, Richard H.: *See*—
Moked, Isaac; Handwerk, Richard H.; and Marshall, Walter R., 4,137,023, Cl. 418-15.000.
Hanes Corporation: *See*—
Bell, Cecil R., Jr.; and Sizemore, Walter R., 4,136,557, Cl. 73-816.000.
Sloan, Donald A.; and King, James F., 4,136,863, Cl. 271-212.000.
Hangartner, Walter; and Pfiffner, Albert, to Hoffmann-La Roche Inc. Insecticidal propargyl ethers. 4,137,329, Cl. 424-342.000.
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Hansen, Arne; and Troup, George, to Chemetron Corporation. Valve for fire extinguishing system of gas distribution type. 4,136,851, Cl. 251-63.000.
Hansen, Sigurd S., to Nordisk Fjerfabrik Aktieselskab. Ribbed tick and method of preparing said ribbed tick. 4,137,111, Cl. 156-65.000.
Hara, Shigeyoshi; and Yamada, Tateyoshi, to Teijin Limited. Heat-curable and solvent-soluble ester group-containing polymer compositions and process for their preparation. 4,137,221, Cl. 528-273.000.
Harada, Yuichi; and Ohya, Yoshinobu, to Daicel Ltd. Interior finish laminates comprising a foam layer applied through use of polyamide adhesives. 4,137,366, Cl. 428-425.000.
Haramoto, Yutaka; Fujii, Yasuhiko; and Yamazaki, Masami, to Victor Company of Japan, Ltd. Phase-shifting circuit. 4,137,507, Cl. 330-302.000.
Harbottle, William E.: *See*—
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Hardy, George F.; and David, Morton E. Adapter for CB radio replacement. 4,136,921, Cl. 339-141.000.
Harnett, Herbert M., to Bunker Ramo Corporation. Interconnector. 4,136,442, Cl. 29-629.000.
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Harris, Cynthia B.: *See*—
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Hart, Cornelis M., to U.S. Philips Corporation. Multi-stage integrated injection logic circuit. 4,137,465, Cl. 307-255.000.
Hartmann, Rudolf: *See*—
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Hartz, Roy E., to Uniroyal, Inc. Micro-crystalline wax dip formulation additives for protection of adhesive-coated fabrics and single end cords. 4,137,358, Cl. 428-272.000.
Harvey, James A.: *See*—
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Mascia, Carmen T.; and Hasegawa, Gary K., 4,136,802, Cl. 222-95.000.
Hasha, Malvern M. Leak testing method and apparatus for tubular members and packer means therefor. 4,136,552, Cl. 73-46.000.
Hashimoto, Naoto; and Kishi, Toyokazu, to Takeda Chemical Industries, Ltd. Method for the production of maytansinoids. 4,137,230, Cl. 260-239.30P.
Haskell, Theodore H.: *See*—
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Hass, Hansjurgen: *See*—
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Hawker, Fred D.: *See*—
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Hawker Siddeley Canada Ltd.: *See*—
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Hawkins, Roland L., to Hoechst Fibers Industries. Staple fiber, finish therefor and process for use of same. 4,137,181, Cl. 252-8.900.
Hay, Alexander. Boot drying apparatus. 4,136,464, Cl. 34-104.000.
Hayama, Isao: *See*—
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Hayamizu, Mamoru; and Tanigaki, Yasushi, to Kabushiki Kaisha Daini Seikosha. Method for optically measuring a distance. 4,136,949, Cl. 356-1.000.
Hayashi, Henry T. Clamp-connector for joining tubular members. 4,136,984, Cl. 403-170.000.
Haynes, Stewart, Jr.; Lim, Frank H.; and Alston, Robert B., to Texaco, Inc. Enhanced recovery of oil from a dipping subterranean oil-bearing reservoir using light hydrocarbon and carbon dioxide. 4,136,738, Cl. 166-273.000.
Hazama, Motoo, to Sumitomo Chemical Company, Limited. Process for producing an enamide. 4,137,417, Cl. 560-250.000.
Heaps, Joseph D.; and Tufte, Obert N., to Honeywell Inc. Ceramic coated with molten silicon. 4,137,355, Cl. 428-201.000.
Heaton, Herbert M.: *See*—
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Hedlund, John A., to Hercules Tire & Rubber Company, The. Method of retreading a pneumatic tire. 4,137,112, Cl. 156-96.000.
Hedrick, Ross M., to Monsanto Company. Water based printing ink. 4,137,083, Cl. 106-20.000.
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Eberlein, Wolfgang; Heider, Joachim; Austel, Volkhard; Dammgen, Jurgen; and Kadatz, Rudolf, 4,137,318, Cl. 424-258.000.
Heimberger, Werner; and Schmitt, Hermann, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the purification of waste water containing ammonia and ammonium salts. 4,137,166, Cl. 210-62.000.
Heine, Christian; Wust, Reinhold; and Kamp, Brigitte, to Henkel Kommanditgesellschaft auf Aktien (Henkel KGaA). Process for preserving the freshness of fresh meat using acetylated fatty acid mono-, di-, and triglycerides. 4,137,334, Cl. 426-310.000.
Heinen, Herbert, to Dynamit Nobel Aktiengesellschaft. Method of synthesizing polyvinyl chloride compositions. 4,137,202, Cl. 260-23.0XA.
Heiser, Joachim, to Robert Bosch GmbH. Arrangement for controlling the speed of a hydraulic motor. 4,136,600, Cl. 91-27.000.
Helbig, Joachim: *See*—
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Heller, Lawrence G.; and Terman, Lewis M., to International Business Machines Corporation. Charge-transfer binary search generating circuit. 4,137,464, Cl. 307-227.000.
Helm, Herbert W.; and Ziegler, Dennis, to F. L. Smithe Machine Company, Inc. Apparatus for changing the length of envelope blanks cut from a continuous web. 4,136,591, Cl. 83-355.000.
Helms, Roger E.: *See*—
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Henry, Loic G.; and Favennec, Pierre N. Process for producing a silicon nitride diffusion barrier on a semiconductor substrate, particularly III–V semiconductor substrates. 4,137,141, Cl. 204-192.0EC.
Henshaw, Bruce C.: *See*—
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Hesse, Karl-Heinz; Ruhnau, Gerhard; Gudat, Wolfgang; and Liermann, Peter, to WABCO Westinghouse G.m.b.H. Method and arrangement for filtering digital, measured cycle-duration values, in particular in antiskid control devices on vehicles. 4,136,912, Cl. 303-91.000.
Hesse, Kurt; Wehling, Karl; and Staff, Alfred, to Staff KG. Rail for supporting electrical fixtures. 4,137,424, Cl. 174-97.000.
Hetman, Frank W.; Rakouska, Kenneth D.; and Baron, Robert N., to Alpana Aluminum Products, Inc. Apparatus for cleaning a column of windows and wall surfaces of a building. 4,136,419, Cl. 15-302.000.
Hetrick, George, to Gorman, Richard L., a part interest. Safety device for portable firearms. 4,136,476, Cl. 42-1.0LP.
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Hille Engineering Company Limited: *See*—
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Hines, Paul R.; Shelly, Edward A.; and Hines, Paul R. Fishhook device. 4,136,477, Cl. 43-15.000.
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Hinz, Hans-Dieter; and Rothgordt, Ulf, to U.S. Philips Corporation. Electrostatic printing device with air cushion guiding. 4,137,536, Cl. 346-155.000.
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Hoeksema, Herman, to Upjohn Company, The. Novel degradation products of rubradirin and rubradirin B. 4,137,410, Cl. 544-101.000.
Hoffman, Herbert F. Livestock sorting gate. 4,136,641, Cl. 119-155.000.
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Hofmann, Rudolf. Rotary piston machine. 4,137,019, Cl. 417-462.000.
Hogan, William F., to Spectrum X-Ray Corporation. Infant X-ray examination cradle system. 4,137,456, Cl. 250-456.000.
Hogue, Charles J. Exercising slant board. 4,136,868, Cl. 272-144.000.
Holbrook, George W.; Jakubczak, Eugene R.; and Roth, Charles A., to Dow Corning Corporation. Three component common hydraulic fluid comprising a non-linear siloxane fluid. 4,137,189, Cl. 252-75.000.
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Hollweck, Walter, to Inter Control. Thermostat resetting device. 4,136,569, Cl. 74-2.000.
Holm, Leif G.; and Korremann-Nielsen, Birgitte N., to Alfa-Laval AB. Recovery of fat and meat meal from animal raw material. 4,137,335, Cl. 426-417.000.
Holman, Robert R., to Westinghouse Electric Corp. Apparatus for sealing access holes to cavities within the earth with rock glass. 4,136,524, Cl. 405-131.000.
Holmes, Paul M.: *See*—
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Homer, Joseph F.; Glaeser, John L.; and Bright, Robert P., to Exxon Production Research Company. Device for restraining lateral movement of subsea equipment. 4,136,633, Cl. 114-264.000.
Hon, Edward H., to American Home Products Corporation. Catheter for measuring intrauterine pressure. 4,136,681, Cl. 128-2.00R.
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Honkawa, Tadashi; and Komori, Ritsuo, to Hitachi, Ltd. Method for analyzing one ingredient of a three ingredient mixture. 4,136,959, Cl. 356-418.000.
Honnaker, Leland R.; Jones, Gary L.; and Wood, Walter E., to Du Pont de Nemours, E. I., and Company. Corrosion-resistant spinneret. 4,137,032, Cl. 425-464.000.
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Wagner, George M., 4,137,346, Cl. 427-341.000.
Wallace, Bruce S., 4,137,145, Cl. 204-290.00R.
Hooker, Marvin L., Jr., to Rockwell International Corporation. Digital radar display smoothing. 4,137,530, Cl. 343-5.0VQ.
Hopkinson, Eric C., to Dresser Industries, Inc. Dual detector pulsed neutron logging for providing indication of formation porosity. 4,137,450, Cl. 250-264.000.
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Houle, Conrad G., to Eastman Kodak Company. Antifoggants in heat developable photographic materials. 4,137,079, Cl. 96-55.000.
Howard, Curtis E.; Calvin, Douglas G.; and Pitts, Robert W., Jr., to Texaco Inc. Method for automatically initiating in situ combustion for enhanced thermal recovery of hydrocarbons from a well. 4,136,737, Cl. 166-251.000.
Howard, Guy W.; and Dodd, Brian W. Electrical receptacle with releasable locking means. 4,136,919, Cl. 339-75.00P.
Howard, Julian A. Break-joint power piston screw jack. 4,136,587, Cl. 81-3.00R.
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Hoyer, Norman S.; Slade, Paul G.; and Kossowsky, Ram, to Westinghouse Electric Corp. Electrical contact material of TiC, WC and silver. 4,137,076, Cl. 75-241.000.
Huang, Yung-Yien; Olszewski, Jerzy A.; and Sarkar, Arnab, to General Cable Corporation. Test apparatus for optical waveguides. 4,136,960, Cl. 356-239.000.
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Hugenholtz, Eduard H. Channel selection system for a displaced spectrum frequency synthesizer. 4,137,508, Cl. 331-4.000.
Hughes, John F. Continuous production of starch hydrolysates. 4,137,094, Cl. 127-38.000.
Hughes, Rodney R. Snap-on cap and washer assembly. 4,136,598, Cl. 85-53.000.
Hulbert, Gary F. Infant holder. 4,136,859, Cl. 269-328.000.
Hulsmann, Hans L.; and Renckhoff, Gustav, to Dynamit Nobel Aktiengesellschaft. Method of preparing functionalized celluloses. 4,137,399, Cl. 536-32.000.
Humbert, Francoise; and Davot, Micheline, to Lever Brothers Company. Cosmetic composition. 4,137,302, Cl. 424-47.000.
Humphreys, Geoffrey, to B & G Hydraulics Limited. Hydraulic circuit units. 4,136,713, Cl. 137-561.00A.
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Hunter, James R.; Lazzarotti, Sebastian J.; and Bradshaw, Robert S., to Burroughs Corporation. Mail singulation and culling system. 4,136,780, Cl. 209-539.000.
Hurley, John F.; and Banthin, Clifford R., to Avco Corporation. Infrared radiation suppressor for a gas turbine engine. 4,136,518, Cl. 60-264.000.
Husges, Gerd; and Karl, Rupert, to Schubert & Salzer. Apparatus for feeding a card with fiber material. 4,136,911, Cl. 302-59.000.
Hutchins, Thomas G.: *See*—
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Noorlander, Daniel O., 4,136,639, Cl. 119-14.550.
Ichida, Takeshige; Hontani, Kunihiko; and Hanaoka, Tetsuro, to Matsushita Electric Industrial Co., Ltd. DPCM Coding apparatus. 4,137,549, Cl. 358-13.000.
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, to Bayer Aktiengesellschaft. Polycondensates containing hydroxyquinoline end groups, their use for the preparation of polymers containing metals and metal containing polycondensates. 4,137,219, Cl. 528-177.000.
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Ikeda, Sadahiro: *See*—
Uno, Takeshi; Ikeda, Sadahiro; Yasue, Toshikazu; and Ejiri, Masakazu, 4,136,957, Cl. 356-394.000.
Illinois Tool Works Inc.: *See*—
Hammer, Victor S., Jr., 4,136,599, Cl. 85-80.000.
Owen, Ronald C., 4,136,771, Cl. 206-150.000.
Sidor, Edward F., 4,137,512, Cl. 335-206.000.
Imai, Kazuo: *See*—
Kanamaru, Naokatu; Imai, Kazuo; and Fujino, Hisaaki, 4,137,113, Cl. 156-187.000.
Immel, Otto; Kaiser, Bernd-Ulrich; Schwarz, Hans-Helmut; and Starke, Klaus, to Bayer Aktiengesellschaft. Process for the evaporation of cyclohexanone oxime. 4,137,263, Cl. 260-566.00A.
Imperial Chemical Industries Limited: *See*—
Brown, Geoffrey T.; and Case, John R., 4,137,199, Cl. 521-138.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
Ferroglio, Luigino; and Ratti, Umberto, 4,137,425, Cl. 178-30.000.
Inolex Corporation: *See*—
Lohr, John W., 4,137,191, Cl. 252-153.000.
Institut Francais du Petrole: *See*—
Franck, Jean-Pierre; Freund, Edouard; Marcilly, Christian; and Miquel, Jean, 4,137,147, Cl. 208-61.000.
Institut Merieux: *See*—
Makula, Marie-France; and Plan, Robert, 4,137,222, Cl. 260-112.00B.
Institute of Orthopaedics, The: *See*—
Scales, John T., 4,136,413, Cl. 5-365.000.
Instituto Mexicano del Petroleo: *See*—
Poblano, Raul, 4,137,093, Cl. 106-315.000.
Insulan, Stig G. E.; and Stubdal, Jorn, to Viking-Askim A/S. Suit with inner hood. 4,136,402, Cl. 2-2.10R.
Inter Control: *See*—
Hollweck, Walter, 4,136,569, Cl. 74-2.000.
International Business Machines Corporation: *See*—
Albrecht, Drew E.; Doran, Samuel K.; Michail, Michel S.; and Yourke, Hannon S., 4,137,459, Cl. 250-492.00A.
Angelo, Raymond W.; Armstrong, Edward J.; and Bock, Robert, 4,137,211, Cl. 260-31.4EP.
Chang, Leroy L.; and Esaki, Leo, 4,137,542, Cl. 357-16.000.
Choquet, Michel; Pilost, Daniel; and Vade, Andre, 4,137,427, Cl. 178-69.100.
Goff, Willie, Jr., 4,136,861, Cl. 271-22.000.
Heller, Lawrence G.; and Terman, Lewis M., 4,137,464, Cl. 307-227.000.
Kunz, Barton H.; Shlatz, Myron F.; and Simson, Lowell M., 4,136,862, Cl. 271-186.000.
Mader, Siegfried R.; Masters, Burton J.; and Pogge, H. Bernhard, 4,137,103, Cl. 148-33.000.
Van Vechten, James A., 4,136,525, Cl. 62-3.000.
International Harvester Company: *See*—
Beck, Harold D.; and Kolthoff, C. Paul, Jr., 4,136,735, Cl. 165-125.000.
International Paper Company: *See*—
Nehring, John R., 4,136,696, Cl. 128-278.000.
International Telephone and Telegraph Corporation: *See*—
Collado, Juan; and Leon, Enrique, 4,136,820, Cl. 235-460.000.
Leyrer, Lowell J., 4,136,437, Cl. 29-610.00R.
Inventor's Inc.: *See*—
Albert, Kenneth J., 4,136,799, Cl. 220-415.000.
Irani, Mazin R.: *See*—
Sherif, Fawzy G.; and Irani, Mazin R., 4,137,178, Cl. 252-8.100.
Ireland, Alfred L.; and Osborne, Raymond B., to Edward Rose (Birmingham) Limited. Opening roof for vehicles. 4,136,906, Cl. 296-137.00C.
Irick, Gether, Jr.; and Kelly, Charles A., to Eastman Kodak Company. Oxazole esters and their use as stabilizers in organic compositions. 4,137,235, Cl. 260-307.00R.
Isayama, Sigeharu: *See*—
Mitsuo, Masaru; and Isayama, Sigeharu, 4,136,607, Cl. 99-329.00R.
Isel S.A.: *See*—
Cederquist, Karl; Marechal, Bernard; and Selander, Stig, 4,136,831, Cl. 241-18.000.
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Youji, to Hitachi, Ltd. Process for tertiary treatment of waste waters from anaerobic digestion treatment process. 4,137,158, Cl. 210-16.000.
Ishida, Michiyasu, to Mitsubishi Jukogko Kabushiki Kaisha. Dressing-undressing apparatus. 4,136,409, Cl. 5-91.000.
Ishigaki Kiko Co., Ltd.: *See*—
Yokata, Ittshu, 4,137,171, Cl. 210-150.000.
Ishihara Sangyo Kaisha, Ltd.: *See*—
Nagata, Koichi; Miyazawa, Kokichi; Sato, Takeshi; Tsuchimoto, Masashi; and Kawashima, Junichi, 4,137,293, Cl. 423-140.000.
Ishii, Masaji; Watanabe, Shuzo; Miyai, Akira; and Hiraoka, Hideo, to Denki Kagaku Kogyo Kabushiki Kaisha. Thermionic cathode. 4,137,476, Cl. 313-336.000.
Ishii, Tsumoru: *See*—
Sera, Hidefumi; Ishii, Tsumoru; Yamaguchi, June; and Shiraishi, Hisashi, 4,137,082, Cl. 96-111.000.
Ishikawa, Kazuo, to Aisin Seiki Kabushiki Kaisha. Automatic transmission for automobiles. 4,136,584, Cl. 74-867.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Nakamura, Norio; Tominaga, Satoshi; Kobayashi, Tsuneo; and Nagaoka, Mitsuo, 4,137,090, Cl. 106-106.000.
Ishino, Keizo: *See*—
Kudo, Shiro; Ishino, Keizo; and Takashima, Yoshinori, 4,137,339, Cl. 426-634.000.
Ishioka, Kunio: *See*—
Morita, Kaneji; Sugie, Akio; and Ishioka, Kunio, 4,136,832, Cl. 241-91.000.

Iso, Tadashi: *See—*
Fujita, Tadashi; Oya, Masayuki; Takashina, Hideo; and Iso, Tadashi, 4,137,420, Cl. 562-426.000.
Itakura Soki Co., Ltd.: *See—*
Itakura, Tsuyoshi, 4,137,016, Cl. 417-413.000.
Itakura, Tsuyoshi, to Itakura Soki Co., Ltd. Valve mechanism for an air pump. 4,137,016, Cl. 417-413.000.
Itakura, Yoichi: *See—*
Kawakami, Noboru; Goto, Takeshi; Hirano, Itsuo; and Itakura, Yoichi, 4,137,072, Cl. 75-58.000.
Italiano, Victor J.: *See—*
Reece, John W.; Italiano, Victor J.; and Crump, Leslie L., 4,137,513, Cl. 335-219.000.
Italsider S.p.A.: *See—*
Sarracino, Mario; and Lannaioli, Arduino, 4,136,814, Cl. 228-263.000.
Ito, Fumio: *See—*
Mashimo, Yukio; Uchidoi, Masanori; Yamamichi, Masayoshi; Ito, Fumio; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,137,541, Cl. 354-23.00D.
Ito, Mikiji; Naganuma, Naohiro; and Nagano, Shojiro, to Nippondenso Co., Ltd. Diaphragm type air pump. 4,137,020, Cl. 417-534.000.
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, to Nippondenso Co., Ltd. Electric air-to-fuel ratio control system. 4,136,645, Cl. 123-32.0EE.
Ito, Tadashi: *See—*
Mashimo, Yukio; Uchidoi, Masanori; Yamamichi, Masayoshi; Ito, Fumio; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,137,541, Cl. 354-23.00D.
Ito, Tetsuyoshi: *See—*
Ono, Koichi; Takahara, Toshiyuki; and Ito, Tetsuyoshi, 4,136,894, Cl. 280-729.000.
ITT Industries, Inc.: *See—*
Burgdorf, Jochen; and Stoka, Roberto, 4,136,761, Cl. 188-73.300.
Ivanov, Jury N.; Suris, Leonid I.; Zaitsev, Nikolai M.; and Shikin, Vladimir G. Tensioning and locking strap device. 4,136,422, Cl. 24-170.000.
Iwahara, Makoto, to Victor Company of Japan, Ltd. Frequency band dividing filter. 4,137,510, Cl. 333-6.000.
Iwai, Ikuo: *See—*
Ochi, Masafumi; Masui, Motonobu; and Iwai, Ikuo, 4,137,483, Cl. 315-74.000.
Iwamatsu, Masayuki; and Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Compound transistor circuitry. 4,137,506, Cl. 330-288.000.
Iwasaki Electric Co., Ltd.: *See—*
Ochi, Masafumi; Masui, Motonobu; and Iwai, Ikuo, 4,137,483, Cl. 315-74.000.
Iwasaki, Shozo, to Kabushiki Kaisha Akashi Seisakusho. Reference-load variable hardness tester. 4,136,555, Cl. 73-83.000.
Iyeta, Motoi, to Nippon Gakki Seizo Kabushiki Kaisha. Electromagnet type pickup device. 4,136,884, Cl. 274-37.000.
Izu, Masatsuga; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Method of continuous tone imaging using dispersion imaging material. 4,137,078, Cl. 96-27.00E.
J. I. Case Company: *See—*
Wilson, Charles D., 4,136,792, Cl. 214-145.00A.
J. M. Eltzroth & Associates, Inc.: *See—*
Miller, Russell C., 4,137,368, Cl. 428-461.000.
Jager, Kurt: *See—*
Althoff, Jurgen; Jager, Kurt; Lommel, Heinz; Moller, Manfred; and Potzschke, Manfred, 4,137,102, Cl. 148-31.500.
Jakubczak, Eugene R.: *See—*
Holbrook, George W.; Jakubczak, Eugene R.; and Roth, Charles A., 4,137,189, Cl. 252-75.000.
Jalan, Vinod M.; and Bushnell, Calvin L., to United Technologies Corporation. Catalyst and method for making. 4,137,372, Cl. 429-44.000.
Jalan, Vinod M.; and Bushnell, Calvin L., to United Technologies Corporation. Platinum catalyst and method for making. 4,137,373, Cl. 429-44.000.
Jameson, Robert W. Triangle chain anchor. 4,136,494, Cl. 52-166.000.
Jamieson, John A. Imaging apparatus including spatial-spectral interferometer. 4,136,954, Cl. 356-349.000.
Janes, Norman F.: *See—*
Elliott, Michael; Janes, Norman F.; and Pulman, David A., 4,137,324, Cl. 424-282.000.
Janko, Bozidar, to Tektronix, Inc. Cathode ray tube having an electron lens system including a meshless scan expansion post deflection acceleration lens. 4,137,479, Cl. 313-426.000.
Janowski, Kenneth R.: *See—*
Godsey, Randall D.; Svacha, Roy E.; Crawford, James V.; and Janowski, Kenneth R., 4,136,428, Cl. 29-157.400.
Jansen, Arie: *See—*
Batt, Colin B.; Kucharska, Helena Z.; and Jansen, Arie, 4,137,138, Cl. 204-159.180.
Japan Atomic Energy Research Institute: *See—*
Machi, Sueo; Sugo, Takanobu; Sugishita, Akio; Kanai, Sakunobu; and Fujiwara, Hiroshi, 4,137,137, Cl. 204-159.160.
Jarman Company: *See—*
Leitzel, Ammon M., 4,136,724, Cl. 150-1.500.
Jarvis, Cyril L.; Ayers, Laurence; and Hewitt, Trevor. Trap for grease or other foreign matter dissolved or entrained in a liquid. 4,137,173, Cl. 210-187.000.
Jenkins, Stuart M.; King, Albert K.; and Reece, Raymond D., to De La Rue Instruments Limited. Apparatus for gauging the thickness of moving laminar material. 4,136,454, Cl. 33-147.00L.
Jepson, John W.: *See—*
Haas, Steven L.; Fonteneau, Norman O.; Sullivan, Paul F.; Hottel, Hoyt C., Jr.; Brown, Robert A.; Gobush, William; Jepson, John W.; and Lynch, Francis deS., 4,137,566, Cl. 364-410.000.
Jetaire Company Limited: *See—*
Woodroff, Victor C.; and Walford, John S., 4,137,041, Cl. 432-222.000.
Jifuku, Masayuki: *See—*
Ihara, Masaru; and Jifuku, Masayuki, 4,137,108, Cl. 148-175.000.
Johansson, Erik V.; and Kullander, Mats O., to Billeruds Aktiebolag. Apparatus for continuously coating a web with a liquid. 4,136,635, Cl. 118-50.000.
Johansson, Folke L.; and Svenning, B. F. Staffan, to Atlas Copco Aktiebolag. Slide valve. 4,136,853, Cl. 251-282.000.
Johnson, Alice A. Multiple compartment bread vending machine. 4,136,764, Cl. 194-32.000.
Johnson, Curtis D. Van roof ventilator. 4,136,605, Cl. 98-2.180.
Johnson, Grover L.: *See—*
Deffeyes, Robert J.; and Johnson, Grover L., 4,137,361, Cl. 428-328.000.
Johnson & Johnson: *See—*
Dabroski, Winifred C., 4,136,687, Cl. 128-91.00R.
Dyke, Denis G., 4,136,693, Cl. 128-214.00C.
Mesek, Frederick K., 4,136,698, Cl. 128-287.000.
Johnston, Robert J.: *See—*
Dobrosielski, Stephen S.; Layciak, Stephen G.; and Johnston, Robert J., 4,136,924, Cl. 339-263.00R.
Jones, Charles, to Curtiss-Wright Corporation. Rotor for rotary piston mechanism. 4,137,024, Cl. 418-61.00A.
Jones, David W., to Creavco, Inc. Accumulator drain closure. 4,136,714, Cl. 138-30.000.
Jones, Eugene C., to American Hospital Supply Corporation. Method of making a solvent-bonded joint. 4,137,117, Cl. 156-294.000.
Jones, Gary L.: *See—*
Honnaker, Leland R.; Jones, Gary L.; and Wood, Walter E., 4,137,032, Cl. 425-464.000.
Jones, Joseph S., to Bell Telephone Laboratories, Incorporated. Electromechanical filter and resonator. 4,137,511, Cl. 333-71.000.
Jones, Lawrence T.; Sims, Anson; and Howden, Ashley G., to California R&D Center. Miniature vehicle. 4,136,485, Cl. 46-251.000.
Jones, William J., to Westinghouse Electric Corp. Method for verifying the pressure in a nuclear reactor fuel rod. 4,136,553, Cl. 73-52.000.
Jorkasky, Richard J., II: *See—*
Li, George S.; and Jorkasky, Richard J., II, 4,137,281, Cl. 260-878.00R.
Judaev, Vasily F.: *See—*
Varlamov, Vladimir M.; Sopin, Anatoly I.; Judaev, Vasily F.; Romanov, Jury P.; Kokarev, Dmitry T.; Metelyagin, Alexandr Z.; Shestakov, Vladislav A.; Fomin, Vladimir I.; and Filin, Vladimir A., 4,136,971, Cl. 366-169.000.
Junzo Shimoiizaka: *See—*
Morita, Kaneji; Sugie, Akio; and Ishioka, Kunio, 4,136,832, Cl. 241-91.000.
Juszak, Joseph J.: *See—*
McKinzie, Richard E.; and Juszak, Joseph J., 4,136,895, Cl. 282-9.00R.
K B Southern, Inc.: *See—*
Becker, John H., 4,137,006, Cl. 415-201.000.
Kabel-und Metallwerke Gutehoffnungshuette AG: *See—*
Tuschy, Eckhard; and Wischmeyer, Georg, 4,136,543, Cl. 72-78.000.
Kabushiki Kaisha Akashi Seisakusho: *See—*
Iwasaki, Shozo, 4,136,555, Cl. 73-83.000.
Kabushiki Kaisha Daini Seikosha: *See—*
Hayamizu, Mamoru; and Tanigaki, Yasushi, 4,136,949, Cl. 356-1.000.
Kabushiki Kaisha Mitutoyo Seisakusho: *See—*
Yamauchi, Mineo; and Nakahara, Masao, 4,136,456, Cl. 33-164.00C.
Kabushiki Kaisha Niihama Tekkojo: *See—*
Kato, Nobuhide; Yasuno, Ryo; and Yajima, Susumu, 4,136,624, Cl. 110-236.000.
Kabushiki Kaisha Suwa Seikosha: *See—*
Mukaiyama, Fumiaki, 4,137,523, Cl. 340-813.000.
Kabushiki Kaisha Yamashina Seikosho: *See—*
Takemura, Akira; and Utsumi, Tadao, 4,136,597, Cl. 85-41.000.
Kadatz, Rudolf: *See—*
Eberlein, Wolfgang; Heider, Joachim; Austel, Volkhard; Dammgen, Jurgen; and Kadatz, Rudolf, 4,137,318, Cl. 424-258.000.
Kading, Gert, to Mannesmann Aktiengesellschaft. Cooling continuously cast ingots. 4,136,527, Cl. 62-64.000.
Kaganowicz, Grzegorz; Robinson, John W.; and Yasuda, Hirotsugu, to RCA Corporation. Video disc with a dielectric layer formed from acetylene and nitrogen. 4,137,550, Cl. 358-128.000.
Kaiser, Bernd-Ulrich: *See—*
Immel, Otto; Kaiser, Bernd-Ulrich; Schwarz, Hans-Helmut; and Starke, Klaus, 4,137,263, Cl. 260-566.00A.
Kajima Corporation: *See—*
Sato, Kuniaki, 4,136,811, Cl. 228-165.000.
Kallenbach, Heinz-Dieter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Device using oil for heating the operator's cab of a machine. 4,136,824, Cl. 237-12.30R.
Kaltenbronn, James S.; Haskell, Theodore H.; and Doub, Leonard, to Warner-Lambert. [Amino sulfonyl-2-oxo-nicotinyl]derivatives of cephalosporin. 4,137,408, Cl. 544-28.000.

Kamm, Lawrence J. Limit switch assembly for manufacturing machine. 4,137,432, Cl. 200-47.000.

Kamp, Brigitte: *See*—
Heine, Christian; Wust, Reinhold; and Kamp, Brigitte, 4,137,334, Cl. 426-310.000.

Kamphorst, Walter: *See*—
Lukes, Henry J.; and Kamphorst, Walter, 4,136,558, Cl. 73-119.00A.

Kanai, Sakunobu: *See*—
Machi, Sueo; Sugo, Takanobu; Sugishita, Akio; Kanai, Sakunobu; and Fujiwara, Hiroshi, 4,137,137, Cl. 204-159.160.

Kanamaru, Naokatu; Imai, Kazuo; and Fujino, Hisaaki, to Toray Industries, Inc. Production of a liquid separation module. 4,137,113, Cl. 156-187.000.

Kanao, Mitsuhiro. Needle nozzle having a valve. 4,136,829, Cl. 239-533.100.

Kanda, Takeshi: *See*—
Mohri, Michihiro; Takeda, Hiroo; Tsunemi, Masaaki; Uchiumi, Tadashi; and Kanda, Takeshi, 4,137,162, Cl. 210-40.000.

Kandou, Akiyoshi; and Yoneya, Kiyoo, to Yoshida Kogyo K K. Presser foot. 4,136,626, Cl. 112-235.000.

Kane, William S.: *See*—
Cardwell, Paul H.; and Kane, William S., 4,137,291, Cl. 423-24.000.

Kaneko, Yutaka: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Kaneko, Yutaka; and Masukawa, Toyoaki, 4,137,080, Cl. 96-55.000.

Kanigan, Cecil. Block or brick laying guide reinforcing module. 4,136,498, Cl. 52-604.000.

Kanten, Thomas M., to Minnesota Mining and Manufacturing Company. Cobalt-doped acicular hyper-magnetite particles. 4,137,342, Cl. 427-127.000.

Kantor, Frederick W. Rotary thermodynamic apparatus and method. 4,136,530, Cl. 62-499.000.

Kao Soap Co., Ltd.: *See*—
Sakurai, Akira; and Fujita, Manabu, 4,137,196, Cl. 252-522.000.

Kaplan, Albert. Variable numerical selection apparatus. 4,136,876, Cl. 273-138.00R.

Karashima, Masashi. Showcase equipment. 4,136,783, Cl. 211-49.00D.

Karasick, Norman M. Solar collector. 4,136,675, Cl. 126-271.000.

Karl, Rupert: *See*—
Husges, Gerd; and Karl, Rupert, 4,136,911, Cl. 302-59.000.

Karl Suss KG: *See*—
Suss, Winfried, 4,136,459, Cl. 33-180.00R.

Karlsson, Birgitta G.: *See*—
Af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,137,225, Cl. 260-112.50R.

Kataoka, Shoei: *See*—
Komamiya, Yasuo; Tateno, Hiroshi; Kataoka, Shoei; and Mititada, Morisue, 4,137,569, Cl. 364-784.000.

Kato, Nobuhide; Yasuno, Ryo; and Yajima, Susumu, to Sumitomo Durez Co., Ltd; and Kabushiki Kaisha Niihama Tekkojo. Incinerator for refuse in containers and method of incineration therefor. 4,136,624, Cl. 110-236.000.

Kauer, Harald: *See*—
Pietzsch, Ludwig; Kauer, Harald; and Hartmann, Rudolf, 4,136,913, Cl. 305-58.0PC.

Kauffman, Robert N.: *See*—
Smith, James D. B.; and Kauffman, Robert N., 4,137,275, Cl. 260-830.0TW.

Kawada, Koji: *See*—
Ueda, Tadao; Nagaya, Teruo; and Kawada, Koji, 4,137,136, Cl. 204-98.000.

Kawakami, Noboru; Goto, Takeshi; Hirano, Itsuo; and Itakura, Yoichi, to Toyo Soda Manufacturing Co., Ltd. Additive for use in refining iron. 4,137,072, Cl. 75-58.000.

Kawamoto, Itsushi: *See*—
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,136,645, Cl. 123-32.0EE.

Kawamura, Yoshihisa: *See*—
Suzuki, Suzuo; Kawamura, Yoshihisa; and Ezoe, Mitsuhiko, 4,136,564, Cl. 73-194.00F.

Kawamura, Yoshio, to Kawasaki Jukogyo Kabushiki Kaisha. Suction air muffler for a motorcycle. 4,136,756, Cl. 181-229.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Kawamura, Yoshio, 4,136,756, Cl. 181-229.000.

Kawasaki, Mikio: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Kaneko, Yutaka; and Masukawa, Toyoaki, 4,137,080, Cl. 96-55.000.

Kawashima, Junichi: *See*—
Nagata, Koichi; Miyazawa, Kokichi; Sato, Takeshi; Tsuchimoto, Masashi; and Kawashima, Junichi, 4,137,293, Cl. 423-140.000.

Kelly, Charles A.: *See*—
Irick, Gether, Jr.; and Kelly, Charles A., 4,137,235, Cl. 260-307.00R.

Kelly, Joseph E. Solar energy assembly. 4,137,097, Cl. 136-89.0PC.

Kelly, Ralph: *See*—
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,137,301, Cl. 424-45.000.

Kelly, William R.; and Barbin, Robert L., to RCA Corporation. Method and apparatus for optimizing color purity in a color kinescope. 4,137,548, Cl. 358-10.000.

Kelsey, Ronald D.: *See*—
Perry, Vernon L.; and Kelsey, Ronald D., 4,136,781, Cl. 209-552.000.

Kempter, Fritz E.; Gulbins, Erich; Haag, Armin; and Kroker, Rupprecht, to BASF Aktiengesellschaft. Pigment formulations for use in surface-coating binders. 4,137,213, Cl. 260-39.00P.

Kenney, Edward J., to Hooker Chemicals & Plastics Corp. Hollow bipolar electrolytic cell anode-cathode connecting device. 4,137,144, Cl. 204-268.000.

Kent, Jerry B., to New World Products, Inc.; and Tri-Texas, Inc., part interest to each. Tire protection composition. 4,137,206, Cl. 260-29.60B.

Kenyon, Jack; and Heaton, Herbert M., to Moseley Rubber Company Limited, The. Removal of moisture from a sludge slurry or the like. 4,137,167, Cl. 210-81.000.

Kerb, Ulrich: *See*—
Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; Kieslich, Klaus; and Wiechert, Rudolf, 4,137,269, Cl. 260-586.00E.

Kern & Co. AG: *See*—
Aeschlimann, Heinz; Nunlist, Rene; and Stocker, Rudolf, 4,136,955, Cl. 356-152.000.

Kerr, John. Key holding tool. 4,136,589, Cl. 81-425.00A.

Kersten, Ralf: *See*—
Auracher, Franz; and Kersten, Ralf, 4,136,439, Cl. 29-624.000.

KHD Industrieanlagen AG: *See*—
Stolzenberg, Heinz, 4,137,039, Cl. 432-103.000.

Khokhulin, Vladimir N.; Grachev, Andrei N.; Shver, Valery G.; and Kozlov, Valentin L. Arrangement for abrasive machining of shaped surfaces. 4,136,487, Cl. 51-33.00R.

Khromov-Borisov, Nikolai V.; Torf, Samuil F.; Cherepanova, Valentina P.; and Danilov, Anatoly F. p,p″bis-Quaternary ammonium salts of p-terphenyl and method of preparing same. 4,137,239, Cl. 260-326.820.

Kieslich, Klaus: *See*—
Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; Kieslich, Klaus; and Wiechert, Rudolf, 4,137,269, Cl. 260-586.00E.

Kilby, Jack S.; Lathrop, Jay W.; and Porter, Wilbur A., to Texas Instruments Incorporated. Light energy conversion. 4,136,436, Cl. 29-572.000.

Kim, Duk H., to Boeing Commercial Airplane Company. Method of determining corrosion resistance of anodized aluminum. 4,137,047, Cl. 23-230.00C.

King, Albert K.: *See*—
Jenkins, Stuart M.; King, Albert K.; and Reece, Raymond D., 4,136,454, Cl. 33-147.00L.

King, Hewson N. G.; and Scott, Julian P., to U.S. Philips Corporation. Electron image projection masks. 4,137,458, Cl. 250-492.00A.

King, James F.: *See*—
Sloan, Donald A.; and King, James F., 4,136,863, Cl. 271-212.000.

Kinney, Alfred W., to Phillips Petroleum Company. Production of a marbled product. 4,136,720, Cl. 141-9.000.

Kinser, Vernon. Score keeping methods. 4,136,870, Cl. 273-54.00C.

Kinsey, Bernard B. Heating and cooling efficiency control. 4,136,730, Cl. 165-12.000.

Kinzler, Raymond C.; and Bartlebaugh, Harry R., to Koppers Company, Inc. Gravity motivated hopper. 4,136,804, Cl. 222-547.000.

Kirch, Bernard P.: *See*—
Gaillot, Jean-Paul; and Kirch, Bernard P., 4,136,707, Cl. 137-75.000.

Kirkman, Richard T.: *See*—
Mallory, James D.; and Kirkman, Richard T., 4,137,061, Cl. 65-232.000.

Kirton, John: *See*—
Hilsum, Cyril; Kirton, John; and Mears, Adrian L., 4,137,481, Cl. 313-503.000.

Kishi, Toyokazu: *See*—
Hashimoto, Naoto; and Kishi, Toyokazu, 4,137,230, Cl. 260-239.30P.

Kitagawa, Yoshiyasu: *See*—
Nashiwa, Hajime; Mori, Akiyoshi; and Kitagawa, Yoshiyasu, 4,137,104, Cl. 148-36.000.

Kitamura, Sadafumi: *See*—
Yamamitsu, Chojuro; Arimura, Ichiro; Kitamura, Sadafumi; and Meki, Norio, 4,137,547, Cl. 358-8.000.

Kitano, Noritoshi: *See*—
Endo, Akira; Terahara, Akira; Kitano, Noritoshi; Ogiso, Akira; and Mitsui, Seiji, 4,137,322, Cl. 424-273.00R.

KLarin, Gennady P.: *See*—
Mushenko, Nikolai Y.; KLarin, Gennady P.; Seredenko, Vladimir P.; and Svetikov, Ivan P., 4,136,827, Cl. 239-419.300.

Klaubert, Dieter H.: *See*—
Sellstedt, John H.; Guinosso, Charles J.; Shriver, David A.; and Klaubert, Dieter H., 4,137,325, Cl. 424-311.000.

Klauschenz & Perrot KG: *See*—
Perrot, Erwin, 4,137,168, Cl. 210-96.00M.

Klees, Garry W. Game board apparatus. 4,136,883, Cl. 273-281.000.

Klein Associates, Inc.: *See*—
Klein, Martin, 4,137,538, Cl. 346-165.000.

Klein, Gerald L.; and Meyer, Richard C., to Beckman Instruments, Inc. Nephelometer with detection system focused on optical dark region. 4,136,953, Cl. 356-339.000.

Klein, Martin, to Klein Associates, Inc. Process and apparatus for compatible wet and dry paper signal recording. 4,137,538, Cl. 346-165.000.

Klein, Robert W.; and Nuss, George W., Jr., to William H. Rorer, Inc. Synergistic compositions and method of use. 4,137,311, Cl. 424-240.000.

Klimpel, Richard R.: *See*—
Manfroy, Willy; and Klimpel, Richard R., 4,136,830, Cl. 241-16.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Kallenbach, Heinz-Dieter, 4,136,824, Cl. 237-12.30R.

Knapp, Heinrich; Schwartz, Reinhardt; Schlott, Walter; Riel, Klaus; and Peters, Klaus-Jurgen, to Robert Bosch GmbH. Pressure control valve assembly. 4,136,653, Cl. 123-139.0AW.

Knight, Lloyd K., to Dresser Industries, Inc. Renewable tip hammer for a crusher. 4,136,833, Cl. 241-194.000.

Knight, Stephen: *See*—
Federico, Joseph; Knight, Stephen; and Waaben, Sigurd G., 4,137,428, Cl. 179-1.0SW.

Knittel, Volker: *See*—
Debus, Gerhard; and Knittel, Volker, 4,137,088, Cl. 106-90.000.

Knobel, Gladys; and Prisland, Theodore. Scarf hanger. 4,136,784, Cl. 211-119.000.

Kobayashi, Mitsunori: *See*—
Doi, Yoshihiko; Saito, Yasuhiro; Kobayashi, Mitsunori; and Hiraoka, Seiki, 4,137,106, Cl. 148-126.000.

Kobayashi, Tsuneo: *See*—
Nakamura, Norio; Tominaga, Satoshi; Kobayashi, Tsuneo; and Nagaoka, Mitsuo, 4,137,090, Cl. 106-106.000.

Kockler, Barry C.: *See*—
Townsend, Robert H.; and Kockler, Barry C., 4,137,449, Cl. 235-485.000.

Koehler, Toivo. Mercury cadmium telluride photodiode. 4,137,544, Cl. 357-30.000.

Koenig, Karl-Heinz; Reitel, Christian; and Mangold, Dietrich, to BASF Aktiengesellschaft. Manufacture of N-vinyl-N-alkyl-carbamic acid chlorides. 4,137,261, Cl. 260-544.00C.

Koerner, Gotz; and Patzke, Hans-Jurgen, to TH. Goldsmith AG. Process for the production of an aqueous preparation for shrink-proofing wool. 4,137,179, Cl. 252-8.600.

Kohara, Minoru: *See*—
Sagane, Norio; Kohara, Minoru; Shiohara, Tomoo; and Araki, Yasuhiko, 4,137,383, Cl. 526-24.000.

Kohler, John B.: *See*—
Graff, Hart F.; Kohler, John B.; Parks, Noel W.; Pierson, Marvin B.; Schnedler, Paul E.; and Strait, Richard E., 4,137,347, Cl. 427-349.000.

Kohner, Frank; Stern, Ralph; and Stubbmann, Albert, to Wecolite Co., Inc. Multi-game toy mounted on turntable. 4,136,875, Cl. 273-121.00R.

Koike, Takashi; and Amano, Masahiro, to Mitsubishi Paper Mills, Ltd. Transparent cellulosic paper and method for making the same. 4,137,046, Cl. 8-192.000.

Koizumi, Yutaka. Visual display apparatus. 4,136,943, Cl. 355-5.000.

Kokarev, Dmitry T.: *See*—
Varlamov, Vladimir M.; Sopin, Anatoly I.; Judaev, Vasily F.; Romanov, Jury P.; Kokarev, Dmitry T.; Metelyagin, Alexandr Z.; Shestakov, Vladislav A.; Fomin, Vladimir I.; and Filin, Vladimir A., 4,136,971, Cl. 366-169.000.

Kolb, William A., to United States Steel Corporation. Method and apparatus for automatically controlling the rate of flux injection to a converter. 4,136,857, Cl. 266-80.000.

Koleske, Joseph V.: *See*—
Smith, Oliver W.; and Koleske, Joseph V., 4,137,279, Cl. 260-861.000.

Kolesnichenko, Anatoly A.: *See*—
Suslin, Vladimir I.; Makeev, Boris A.; Dubovik, Alexandr I.; Lekarev, Zinovy A.; Pilipenko, Vitaly A.; Etnaer, Alexandr I.; Kolesnichenko, Anatoly A.; and Razdymakha, Pavel S., 4,137,143, Cl. 204-224.00M.

Koller, Stefan: *See*—
Defago, Raymond; Koller, Stefan; and Moser, Peter, 4,137,042, Cl. 8-2.50A.

Kolthoff, C. Paul, Jr.: *See*—
Beck, Harold D.; and Kolthoff, C. Paul, Jr., 4,136,735, Cl. 165-125.000.

Komai, Takeshi; Matsuyama, Kazuo; and Mizuno, Kazuhiro, to Nippon Oil and Fats Co., Ltd. Dicyclododecyl peroxydicarbonate. 4,137,252, Cl. 260-463.000.

Komamiya, Yasuo; Tateno, Hiroshi; Kataoka, Shoei; and Mititada, Morisue, to Agency of Industrial Science & Technology. Logic circuit system using high electric field domain. 4,137,569, Cl. 364-784.000.

Komanduri, Rangachary: *See*—
Shaw, Milton C.; Komanduri, Rangachary; and Kumekawa, Soichi, 4,137,516, Cl. 338-67.000.

Komarov, Jury I.; Lukhmanov, Viktor M.; Kudryavtsev, Evgeny P.; Titov, Dmitry V.; and Kovalev, Gennady I., to Vsesojuzny Nauchno-Issledovatelsky Institut Legkogo I Textilnogo Mashinostroenia. Travelling-wave loom with loom-stopping mechanism. 4,136,717, Cl. 139-436.000.

Komori, Ritsuo: *See*—
Honkawa, Tadashi; and Komori, Ritsuo, 4,136,959, Cl. 356-418.000.

Kompis, Ivan; and Wick, Alexander E., to Hoffmann-La Roche Inc. Preparation of 2,4-diamino-5-(4-amino-3,5-substituted-benzyl)-pyrimidines. 4,137,411, Cl. 544-325.000.

Konishi, Yoshimune: *See*—
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,136,645, Cl. 123-32.0EE.

Konishiroku Photo Industry Co., Ltd.: *See*—
Fujiwhara, Mitsuto; Matsuo, Syunji; Kawasaki, Mikio; Kaneko, Yutaka; and Masukawa, Toyoaki, 4,137,080, Cl. 96-55.000.

Kono, Tatsuhiko: *See*—
Murai, Hiromu; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, 4,137,231, Cl. 546-242.000.

Kontsov, Jury M.: *See*—
Ignatiev, Alexei K.; Nemets, Rusaam S.; Gorbulev, Efim S.; Stolyarova, Elena N.; and Kontsov, Jury M., 4,136,718, Cl. 140-105.000.

Kontz, Robert F.: *See*—
Dickson, Andrew C.; and Kontz, Robert F., 4,137,031, Cl. 425-393.000.

Koppers Company, Inc.: *See*—
Kinzler, Raymond C.; and Bartlebaugh, Harry R., 4,136,804, Cl. 222-547.000.

Koppers, Manfred, to Thyssen Industrie AG. Canopy and shield structure for a supporting shield in a seam-like mine deposit. 4,136,999, Cl. 405-295.000.

Kopse, Odon: *See*—
Kulke, Gunter; Kopse, Odon; and Schuster, Gregor, 4,136,654, Cl. 123-139.0AT.

Kordyban, William W.; and Claassen, Lutz, deceased (by Claasen, Gayle L., administratrix), to Hawker Siddeley Canada Ltd. Floating pad saw guide. 4,136,590, Cl. 83-169.000.

Korr, Abraham L., to A. L. Korr Associates, Inc. System for solar radiation energy collection and conversion. 4,136,674, Cl. 126-271.000.

Korremann-Nielsen, Birgitte N.: *See*—
Holm, Leif G.; and Korremann-Nielsen, Birgitte N., 4,137,335, Cl. 426-417.000.

Kosnik, Kenneth G.: *See*—
Leone, Stephen R.; and Kosnik, Kenneth G., 4,137,509, Cl. 331-94.50G.

Kossowsky, Ram: *See*—
Hoyer, Norman S.; Slade, Paul G.; and Kossowsky, Ram, 4,137,076, Cl. 75-241.000.

Kovalev, Gennady I.: *See*—
Komarov, Jury I.; Lukhmanov, Viktor M.; Kudryavtsev, Evgeny P.; Titov, Dmitry V.; and Kovalev, Gennady I., 4,136,717, Cl. 139-436.000.

Kowalchuk, John, to Lever Brothers Company. Powdered detergent compositions containing a calcium salt of an anionic surfactant. 4,137,197, Cl. 252-532.000.

Koyo Seiko Company Limited: *See*—
Okuda, Hiroji, 4,136,532, Cl. 64-23.000.
Okuda, Hiroji, 4,136,533, Cl. 64-23.000.

Kozlov, Mikhail D.: *See*—
Gorodissky, Leonid G.; Vasilieva, Raisa V.; Kozlov, Mikhail D.; Romanov, Nikolai T., deceased; and Romanova, Anastasia I., administrator, 4,136,536, Cl. 68-5.00E.

Kozlov, Valentin L.: *See*—
Khokhulin, Vladimir N.; Grachev, Andrei N.; Shver, Valery G.; and Kozlov, Valentin L., 4,136,487, Cl. 51-33.00R.

Kraft, Inc.: *See*—
Miller, Roland E.; Scaletta, Joseph A.; and Valek, John, 4,136,627, Cl. 113-18.00A.

Kraftwerk Union Aktiengesellschaft: *See*—
Krieger, Gerd, 4,137,474, Cl. 310-227.000.
Tratz, Herbert; Welch, Richard; and Hoffmann, Jurgen, 4,136,644, Cl. 122-32.000.

Kramer, Daniel: *See*—
Piet, Zenon; and Kramer, Daniel, 4,137,057, Cl. 62-89.000.

Kramer Trenton Co.: *See*—
Piet, Zenon; and Kramer, Daniel (said Zenon Piet assors. to), 4,137,057, Cl. 62-89.000.

Kratochwilla, Hans-Michael: *See*—
Guenther, Werner; Stueber, Franz; Muether, Manfred; and Kratochwilla, Hans-Michael, 4,136,450, Cl. 32-22.000.

Kraus, Helmut; Muller, Heinz; Huber, Hans; and Ruchlak, Kasimir, to Hoechst Aktiengesellschaft. Finely distributed polyvinyl chloride molding compositions capable of being sintered. 4,137,381, Cl. 526-3.000.

Krauss, Otto; and Lendl, Josef, to Triumph Werke Nurnberg A.G. Mount for a consumable electrode matrix printer. 4,136,977, Cl. 400-120.000.

Krieger, Gerd, to Kraftwerk Union Aktiengesellschaft. Gas-cooled slip ring for electrical machines. 4,137,474, Cl. 310-227.000.

Krimmel, Eberhard, to Siemens Aktiengesellschaft. Method of producing implanted areas in a substrate. 4,137,457, Cl. 250-492.00A.

Kroger Company, The: *See*—
Christner, Willis D.; and Ortman, Howard J., 4,136,800, Cl. 221-1.000.

Kroker, Ruprecht: *See*—
Kempter, Fritz E.; Gulbins, Erich; Haag, Armin; and Kroker, Ruprecht, 4,137,213, Cl. 260-39.00P.

Krol, Johannes W. A.; Lersmacher, Bernhard; Lydtin, Hans; and Seifert, Horst, to U.S. Philips Corporation. Electrodes, for example grid-like electrodes for use in electron tubes, and a method for manufacturing same. 4,137,477, Cl. 313-348.000.

Krom, Jan H.: *See*—
Grashow, Joseph; and Krom, Jan H., 4,136,986, Cl. 403-197.000.

Kronseder, Hermann; and Wiess, Wilhelm, to Kronseder, Hermann. Method and device for cleaning bottle filling machines and the like. 4,136,719, Cl. 141-1.000.

Kronseder, Hermann: *See*—
Muller, Alois, 4,137,121, Cl. 156-571.000.

Krueger, Hans; and Welsch, Wolfgang, to Siemens Aktiengesellschaft.

Compound indicator device containing at least one liquid crystal cell. 4,136,932, Cl. 350-335.000.
Kucharska, Helena Z.: *See—*
Batt, Colin B.; Kucharska, Helena Z.; and Jansen, Arie, 4,137,138, Cl. 204-159.180.
Kudo, Shiro; Ishino, Keizo; and Takashima, Yoshinori, to Asahimatsu Koridofu Kabushiki Kaisha. Method of preparing processed food material from soybean. 4,137,339, Cl. 426-634.000.
Kudryavtsev, Evgeny P.: *See—*
Komarov, Jury I.; Lukhmanov, Viktor M.; Kudryavtsev, Evgeny P.; Titov, Dmitry V.; and Kovalev, Gennady I., 4,136,717, Cl. 139-436.000.
Kuehn, Robert L., to Baxter Travenol Laboratories, Inc. Separable integral donor tube utilizing an integral plastic member with tube clamp. 4,136,694, Cl. 128-214.00D.
Kukla, Michael J., to G. D. Searle & Co. 5-Substituted-2-phenylbenzo[b]thiophene-3-alkylamines and related compounds. 4,137,414, Cl. 544-376.000.
Kulke, Gunter; Kopse, Odon; and Schuster, Gregor, to Robert Bosch GmbH. Fuel injection nozzle for preliminary and main injection into internal combustion engines. 4,136,654, Cl. 123-139.0AT.
Kullander, Mats O.: *See—*
Johansson, Erik V.; and Kullander, Mats O., 4,136,635, Cl. 118-50.000.
Kullberg, Bengt G. A. E. Apparatus for the prevention or limitation of water damage. 4,136,823, Cl. 237-8.00R.
Kulpa, Walter J., to Sperry Rand Corporation. Hair roller. 4,136,705, Cl. 132-40.000.
Kumekawa, Soichi: *See—*
Shaw, Milton C.; Komanduri, Rangachary; and Kumekawa, Soichi, 4,137,516, Cl. 338-67.000.
Kunz, Barton H.; Shlatz, Myron F.; and Simson, Lowell M., to International Business Machines Corporation. Paper orientation for duplexing and collating. 4,136,862, Cl. 271-186.000.
Kuo, Chung-Ming; Wang, Richard H. S.; and Bogan, Richard T., to Eastman Kodak Company. Cyclic phosphonite stabilized cellulose ester compositions. 4,137,201, Cl. 260-13.000.
Kupfer-Asbest-Co. Gustav Bach: *See—*
Uhrner, Klaus-Jurgen, 4,136,885, Cl. 277-9.500.
Kupper, Franz J.: *See—*
Reitemeyer, Paul; and Kupper, Franz J., 4,137,028, Cl. 425-141.000.
Kuppersbusch Aktiengesellschaft: *See—*
Lohr, Alfred; and Tschek, Wolfgang, 4,137,337, Cl. 426-637.000.
Kuramoto, Masashi: *See—*
Tsuchihashi, Genichi; Ogura, Katsuyuki; Yaso, Masao; Kuramoto, Masashi; Fujii, Tadashiro; and Watanabe, Tetsuo, 4,137,406, Cl. 544-27.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Yoshida, Masafumi; and Murayama, Naohiro, 4,137,475, Cl. 310-323.000.
Kuroyanagi, Yoshitaka; and Teratani, Tatsuo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Noise suppression device. 4,137,501, Cl. 325-313.000.
Kuwabara, Takao; and Okumura, Hiroshi, to Hitachi, Ltd. Operation-control method for hydraulic machine. 4,137,004, Cl. 415-1.000.
Labat, Pierre, to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem. Change-speed mechanism. 4,136,575, Cl. 74-359.000.
Labrum Engineering, Inc.: *See—*
Labrum, Joseph H.; and Stewart, Donald R., 4,136,950, Cl. 356-28.000.
Labrum, Joseph H.; and Stewart, Donald R., to Labrum Engineering, Inc. Microscope system for observing moving particles. 4,136,950, Cl. 356-28.000.
Lagana, Vincenzo: *See—*
Guadalupi, Mario; Zardi, Umberto; and Lagana, Vincenzo, 4,137,262, Cl. 260-555.00A.
Lamadrid, Rene G.: *See—*
Ebling, Wendell V.; Lamadrid, Rene G.; and Phillips, Earl G., 4,137,160, Cl. 210-22.00A.
Lambert, Patrick. Joining structure. 4,137,115, Cl. 156-257.000.
Lamberti, Vincent, to Lever Brothers Company. Morpholino carboxymethyloxysuccinic anhydrides, halides and derivatives thereof. 4,137,409, Cl. 544-86.000.
Lane, George T. Solar heat collecting module and modular system. 4,136,669, Cl. 126-270.000.
Lang, Jerry M.: *See—*
Clark, Elin R.; Clark, Benny J.; and Lang, Jerry M., 4,136,991, Cl. 404-73.000.
Lange, Robert B. Athletic leg brace apparatus. 4,136,404, Cl. 2-22.000.
Langer, Klaus. Pin micrometer adapter. 4,136,457, Cl. 33-167.000.
Langieri, Michael: *See—*
Meyers, Michael R.; Langieri, Michael; and Cook, Calvin, 4,136,871, Cl. 273-85.00A.
Lannaioli, Arduino: *See—*
Sarracino, Mario; and Lannaioli, Arduino, 4,136,814, Cl. 228-263.000.
Laporte Industries Limited: *See—*
Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, 4,137,297, Cl. 423-561.00R.
Lappa, Cleto L. Two cycle rotary internal combustion engine. 4,136,646, Cl. 123-44.00C.
Larkin, John M., to Texaco, Inc. Preparation of aromatic nitriles. 4,137,254, Cl. 260-465.00E.
Larrabee, Edward W., to Union Carbide Corporation. Light-shielding tube holder for use with blood washing apparatus. 4,136,818, Cl. 233-1.00R.
Larson, Raymond B., to Wells Electronics, Inc. Tester for inflated items. 4,136,554, Cl. 73-81.000.
Lasne, Claude; and Gernez, Alain, to Compagnie Generale d'Electricite S.A. Method of enamelling sheets. 4,137,344, Cl. 427-156.000.
Lassota, Marek J. Rotary compressor and process of compressing compressible fluids. 4,137,021, Cl. 418-1.000.
Lassota, Marek J. Rotary compressor and process of compressing compressible fluids. 4,137,022, Cl. 418-1.000.
Lathrop, Jay W.: *See—*
Kilby, Jack S.; Lathrop, Jay W.; and Porter, Wilbur A., 4,136,436, Cl. 29-572.000.
Lauder, David R.: *See—*
Clegg, Gordon A.; and Lauder, David R., 4,137,376, Cl. 429-104.000.
Lauderdale, Clifton H. Underhood tool and storage compartment. 4,136,904, Cl. 296-37.100.
Layciak, Stephen G.: *See—*
Dobrosielski, Stephen S.; Layciak, Stephen G.; and Johnston, Robert J., 4,136,924, Cl. 339-263.00R.
Laylander, Paul V.: *See—*
Bradford, Rolland H.; Laylander, Paul V.; and Baranyi, Anthony J., 4,136,493, Cl. 52-169.700.
Lazennec, Yvon: *See—*
Desplanches, Gerard; Lazennec, Yvon; and Leboucq, Jacques, 4,137,287, Cl. 264-62.000.
Lazzarotti, Sebastian J.: *See—*
Hunter, James R.; Lazzarotti, Sebastian J.; and Bradshaw, Robert S., 4,136,780, Cl. 209-539.000.
Lazzerini, Giorgio; Vargiu, Silvio; and Pitzalis, Mario, to Societa' Italiana Resine S.I.R. S.p.A. Preparation of novolak epoxy resins. 4,137,220, Cl. 528-135.000.
Learn, Monroe E.: *See—*
Field, Harry; Smith, Monte L.; Whitehead, Jas. A.; and Learn, Monroe E., 4,136,519, Cl. 60-369.000.
Leboucq, Jacques: *See—*
Desplanches, Gerard; Lazennec, Yvon; and Leboucq, Jacques, 4,137,287, Cl. 264-62.000.
Leclerca, Jacques: *See—*
Rodriguez, Ludovic; Leclerca, Jacques; Ykman, Pierre; and Cosement, Eric, 4,137,236, Cl. 260-306.70C.
Le Delliou, Patrick: *See—*
Stein, Claude; and Le Delliou, Patrick, 4,137,210, Cl. 260-31.20R.
Lee, Cheuk M.: *See—*
Zaugg, Harold E.; and Lee, Cheuk M., 4,137,232, Cl. 546-89.000.
Lee, Robert M. Camera case with integral extendable pouch. 4,136,726, Cl. 150-52.00J.
Lee, Wenpo, to Volkswagenwerk Aktiengesellschaft. Fuel delivery system. 4,136,652, Cl. 123-136.000.
Leem, Tae Yoon. Mechanical pencil. 4,136,980, Cl. 401-31.000.
Leeming, Michael R. G.; and Stubbs, John K., to Pfizer Inc. Isoxazole carboxamides of m-aminotetramisole as anthelmintics. 4,137,321, Cl. 424-270.000.
Leeson, Lewis J.: *See—*
Sheth, Pravin; and Leeson, Lewis J., 4,137,300, Cl. 424-21.000.
Leffelman, Victor C., to Nalco Chemical Company. Static mixing device. 4,136,976, Cl. 366-336.000.
Le Goff, Yves: *See—*
Farge, Daniel; Le Goff, Yves; and Poiget, Gilbert, 4,137,315, Cl. 424-248.560.
Lehmann, Rolf, to Escher Wyss Limited. Pressure roll. 4,136,546, Cl. 72-241.000.
Leimgruber, Willy: *See—*
Batcho, Andrew D.; and Leimgruber, Willy, 4,137,404, Cl. 542-442.000.
Leitzel, Ammon M., to Jarman Company. Golf club carrier. 4,136,724, Cl. 150-1.500.
Lekarev, Zinovy A.: *See—*
Suslin, Vladimir I.; Makeev, Boris A.; Dubovik, Alexandr I.; Lekarev, Zinovy A.; Pilipenko, Vitaly A.; Etnaer, Alexandr I.; Kolesnichenko, Anatoly A.; and Razdymakha, Pavel S., 4,137,143, Cl. 204-224.00M.
Lemieux, Raymond U.; Bundle, David R.; and Baker, Donald A., to Chembiomed Limited. Glycoside-ether-ester compounds. 4,137,401, Cl. 536-116.000.
Lemon, Maurice C.: *See—*
Spear, John F.; and Lemon, Maurice C., 4,136,538, Cl. 68-22.00R.
Lemper, Anthony L.; Witschard, Gilbert; and Pattison, Victor A., to Hooker Chemicals & Plastics Corp. Post bulk polymerization process for polyvinyl halide and composition thereof. 4,137,216, Cl. 260-42.140.
Lemper, Anthony L.; and Rosenfeld, Jerold C., to Hooker Chemicals & Plastics Corp. Melt polymerization process and linear aromatic polyesters prepared therefrom. 4,137,278, Cl. 260-860.000.
Lenard, Peter, to Vollmer Werke Maschinenfabrick GmbH. Sharpening machine for saws. 4,136,585, Cl. 76-40.000.
Lendl, Josef: *See—*
Krauss, Otto; and Lendl, Josef, 4,136,977, Cl. 400-120.000.
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Lennox Industries, Inc.: *See—*
Parker, Sidney A., 4,137,014, Cl. 417-326.000.
Lenz, Leonard L. Hydraulic motor. 4,136,602, Cl. 91-491.000.

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Leonard, Vivian A. Error compensator for a timepiece. 4,136,513, Cl. 58-34.000.
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Humbert, Francoise; and Davot, Micheline, 4,137,302, Cl. 424-47.000.
Kowalchuk, John, 4,137,197, Cl. 252-532.000.
Lamberti, Vincent, 4,137,409, Cl. 544-86.000.
Naik, Appaya R.; Todt, Klaus H.; and Wells, Martin A., 4,137,180, Cl. 252-8.800.
Levine, Jack W., to New Hermes, Incorporated. Engraving machine. 4,136,453, Cl. 33-21.00R.
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Li, Chou H. Method for making solid-state device. 4,136,435, Cl. 29-572.000.
Li, George S.; and Jorkasky, Richard J., II, to Standard Oil Company, The. Impact-resistant, high softening maleic anhydride copolymers. 4,137,281, Cl. 260-878.00R.
Li, Ming K.; and MacLaury, Michael R., to General Electric Company. Purification of dichloroethylene compound. 4,137,421, Cl. 568-725.000.
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Daman, Lloyd W.; Marti, Don V., II; Newsom, Michael L.; and Shamp, Donald E., 4,137,037, Cl. 432-3.000.
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Lin, Lawrence H.. to RCA Corporation. Resist development control system. 4,136,940, Cl. 354-298.000.
Lind, LeRoy R. Line frequency deviation monitor. 4,137,496, Cl. 324-78.00Z.
Lindmayer, Joseph, to Solarex Corporation. Constant voltage solar cell and method of making same. 4,137,095, Cl. 136-89.0SG.
Lingl Corporation: *See*—
Lingl, Hans, 4,137,288, Cl. 264-67.000.
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Lipo, Thomas A., to General Electric Company. Feedback control for reduction of cogging torque in controlled current AC motor drives. 4,137,489, Cl. 318-798.000.
Lisfeld, Robert, to Ernst Leitz Wetzlar GmbH. Universal microscope condenser. 4,136,927, Cl. 350-87.000.
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Logan, Ralph A.; and Merz, James L., to Bell Telephone Laboratories, Incorporated. Optical integrated circuit including junction laser with oblique mirror. 4,136,928, Cl. 350-96.110.
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Louvar, Joseph F.; Capraro, Michael A.; and Herring, William M., to BASF Wyandotte Corporation. Filtration process for purifying polyols. 4,137,396, Cl. 536-4.000.
Lowe, Warren, to Chevron Research Company. Antiwear additive and lubricating oil composition containing same. 4,137,187, Cl. 252-46.600.
Lowenschuss, Oscar, to Raythoon Company. Frequency measuring apparatus. 4,137,497, Cl. 324-78.00F.
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Lunstroth, Klaus. Densimeter. 4,136,551, Cl. 73-32.00R.
Luthi, Rudolf, to Styner & Bienz A.G. Method of producing can covers and can covers obtained thereby. 4,136,629, Cl. 113-121.00C.
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M&T Chemicals Inc.: *See*—
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Machi, Sueo; Sugo, Takanobu; Sugishita, Akio; Kanai, Sakunobu; and Fujiwara, Hiroshi, to Japan Atomic Energy Research Institute; and Maruzen Oil Company Limited. Radiation process for the production of graft copolymer to be used for ion-exchange membrane. 4,137,137, Cl. 204-159.160.
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Mack, Frank J.; and Demkowicz, Michael P., to American Home Products Corporation. Orifice sealing device. 4,136,825, Cl. 239-44.000.
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MacLaury, Michael R.: *See*—
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MacLean, Alexander, to Electro Switch Corp. Selector switch relay. 4,137,439, Cl. 200-153.00L.
MacNeill, John H.: *See*—
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Macourt, Dennis J. C. Separation and analysis of particle coatings. 4,136,951, Cl. 356-36.000.
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with solid state memorizing means for a multiplicity of reception frequencies. 4,137,502, Cl. 325-455.000.

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Mager, George E.; Nelson, Frank M.; Gillett, Kenneth; Holt, Charles P.; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; Criswell, Thomas; and Hall, Warren L., to Xerox Corporation. Direct memory access module for a controller. 4,137,565, Cl. 364-200.000.

Maier, Alfred E.; and Ricci, Louis N., to Westinghouse Electric Corp. Circuit breaker having improved movable crossbar and spring holder. 4,137,437, Cl. 200-153.0SC.

Maier, Henry B. Low cost system for developing solar cells. 4,137,096, Cl. 136-89.0TF.

Mairy, Bernard, to Centre de Recherches Metallurgiques-Centrum Voor Research in de Metallurgie. Measuring the surface temperature of a body. 4,136,952, Cl. 356-36.000.

Maitani, Yoshihisa, to Olympus Optical Co., Ltd. Single lens reflex camera. 4,137,539, Cl. 354-152.000.

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Suslin, Vladimir I.; Makeev, Boris A.; Dubovik, Alexandr I.; Lekarev, Zinovy A.; Pilipenko, Vitaly A.; Etnaer, Alexandr I.; Kolesnichenko, Anatoly A.; and Razdymakha, Pavel S., 4,137,143, Cl. 204-224.00M.

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Makula, Marie-France; and Plan, Robert, to Institut Merieux. Protein product, a process for preparation, and application of said product. 4,137,222, Cl. 260-112.00B.

Malley, Frank; and Akers, Raymond F., to Delray Electronics Inc. Apparatus and method for analyzing oil content of water. 4,137,494, Cl. 324-30.00R.

Mallory, Harvey E.; and Ward, James W., to Loffland Brothers Company. Method and means for reduction of oxygen content in drilling fluid. 4,136,747, Cl. 175-66.000.

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Mallory, James D.; and Kirkman, Richard T., to Owens-Illinois, Inc. Apparatus for forming glass containers. 4,137,061, Cl. 65-232.000.

Mammel, A. Dean: *See*—
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Manfroy, Willy; and Klimpel, Richard R., to Dow Chemical Company, The. Ore grinding process containing copolymer grinding aids. 4,136,830, Cl. 241-16.000.

Mangold, Dietrich: *See*—
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Manin, Michel, to Compagnie General de Geophysique. Process for seismic exploration by means of a directive source. 4,136,754, Cl. 181-111.000.

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Mannhardt, Werner G., to Eaton Corporation. Fuel metering valve with inlet metering control. 4,136,655, Cl. 123-139.0AP.

Manookian, Arman, Jr. Crankcase oil vapor recovery system. 4,136,650, Cl. 123-119.00B.

Marass, Josef, to Georg Spiess GmbH. Sheet feeding apparatus. 4,136,865, Cl. 271-270.000.

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Franck, Jean-Pierre; Freund, Edouard; Marcilly, Christian; and Miquel, Jean, 4,137,147, Cl. 208-61.000.

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Maron, Clarence G.; and Sundstrom, Donald W., to Rogers Corporation. Matrix material for printing plates and method of manufacture thereof. 4,137,363, Cl. 428-338.000.

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Marshall, Edward M. Process for weight reduction. 4,137,327, Cl. 424-324.000.

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Marti, Don V., II: *See*—
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Martinez, Roberto. Antenna alarm. 4,137,521, Cl. 340-63.000.

Maruzen Oil Company Limited: *See*—
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Marvin Glass & Associates: *See*—
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Masahiko, Yamada, to Showa Electric Wire & Cable Co., Ltd. Cooling tubes for wire stocks. 4,136,544, Cl. 72-201.000.

Mascia, Carmen T.; and Hasegawa, Gary K., to Continental Group, Inc., The. Reusable can carrier. 4,136,772, Cl. 206-199.000.

Mascia, Carmen T.; and Hasegawa, Gary K., to Continental Group, Inc., The. Spray dispenser with spring biased flexible container. 4,136,802, Cl. 222-95.000.

Masco Corporation: *See*—
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Mashimo, Yukio; Uchidoi, Masanori; Yamamichi, Masayoshi; Ito, Fumio; Tsunekawa, Tokuichi; and Ito, Tadashi, to Canon Kabushiki Kaisha. Automatic exposure control apparatus for a single lens reflex camera. 4,137,541, Cl. 354-23.00D.

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Masters, Burton J.: *See*—
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Matsufuji, Yoji, to Canon Kabushiki Kaisha. Liquid crystalline composition. 4,137,192, Cl. 252-299.000.

Matsui, Hirofumi. Green sand composition for casting. 4,137,085, Cl. 106-38.350.

Matsumoto, Takao, to Tomy Kogyo Co., Inc. Game employing liquid movement to move a playing piece. 4,136,872, Cl. 273-85.00H.

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Maudal, Inge, to General Dynamics Corporation. Quasi-inertial attitude reference platform. 4,136,844, Cl. 244-3.200.

Maurer, Hans. Under spray arrangement for toilet bowls and the like. 4,136,407, Cl. 4-7.000.

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Mayes, C. C. Guard for open fireplace. 4,136,677, Cl. 126-298.000.

Mayes, James T., Jr.; and Rosene, Will A., to McDonnell Douglas Corporation. Ribbed composite structure and process and apparatus for producing the same. 4,137,354, Cl. 428-116.000.

McCarty, William J., to General Electric Company. Air conditioning apparatus. 4,136,529, Cl. 62-280.000.

McClelland, Donald H., to Gates Rubber Company, The. Maintenance-free lead-acid cell. 4,137,377, Cl. 429-145.000.

McClure, Richard J., to Eastman Technology Inc. Magnetic head employing flux interrogation. 4,137,554, Cl. 360-111.000.

McCollum, Robert H. Bracket. 4,136,848, Cl. 248-316.00R.

McCord, Kenneth J. Vertically adjustable bovine roping practice apparatus. 4,136,874, Cl. 273-105.200.

McCormack, Charles E.; and Brown, Martin L., to Du Pont de Nemours, E. I., and Company. Composite article from oriented copolyetherester elastomers. 4,136,715, Cl. 138-130.000.

McCoubrey, George A.: *See*—
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McDaniel, John M.: *See*—
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McDevitt, Jerome A., to Waco Scaffold & Shoring Company. Marine cargo stowage rack. 4,136,785, Cl. 211-190.000.

McDonald, Charles H. Cationic method for emulsifying asphalt-rubber

paving material and a stable thixotropic emulsion of said material. 4,137,204, Cl. 260-28.5AS.

McDonald, David C.: *See—*
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McGonigal, Charles; and Voytko, James E., to Western Electric Company, Inc. Methods of and apparatus for making slotted beam contact elements. 4,136,628, Cl. 113-119.000.

McGraw-Hill, Inc.: *See—*
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McKinzie, Richard E.; and Juszak, Joseph J., to Uarco Incorporated. Indexed manifold set. 4,136,895, Cl. 282-9.00R.

McLeod, Ian C.: *See—*
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McQuay-Perfex Inc.: *See—*
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Mead Corporation, The: *See—*
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Meihuizen, Cornelis E.; Pennings, Albertus J.; and Zwijnenburg, Arie, to Stamicarbon, B.V. Process for continuous preparation of fibrous polymer crystals. 4,137,394, Cl. 528-502.000.

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Melley Energy Systems, Inc.: *See—*
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Melley, Joseph F., Jr., to Melley Energy Systems, Inc. Mobile electric power generating systems. 4,136,432, Cl. 29-469.000.

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Mendenhall, Robert L. Asphalt sleeve mixer apparatus. 4,136,966, Cl. 366-25.000.

Mendoza, Gregory E.; Henthorn, Donald R.; and Taylor, James F., to QMA Inc. Multi-purpose portable hydraulic unit. 4,136,521, Cl. 60-477.000.

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Menzel, Thomas G. Self-releasing jack assembly. 4,136,891, Cl. 280-475.000.

Menzies Developments Pty. Ltd.: *See—*
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Menzies, Maureen: *See—*
Menzies, John I.; and Menzies, Maureen, 4,136,925, Cl. 350-62.000.

Merchant, Floyd S. Alarm zone disabling control circuit. 4,137,526, Cl. 340-506.000.

Merck & Co., Inc.: *See—*
Wildman, George T.; and Datta, Rathin, 4,137,405, Cl. 544-20.000.

Merkel, Stephen F., to Fluid Controls, Inc. Vehicle power steering system. 4,136,753, Cl. 180-133.000.

Merz, James L.: *See—*
Logan, Ralph A.; and Merz, James L., 4,136,928, Cl. 350-96.110.

Mesek, Frederick K., to Johnson & Johnson. Diaper with tab fastener having grippable adhesive-free end region. 4,136,698, Cl. 128-287.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Althoff, Jurgen; Jager, Kurt; Lommel, Heinz; Moller, Manfred; and Potzschke, Manfred, 4,137,102, Cl. 148-31.500.
Braizler, Karl; and Doerges, Alexander, 4,137,294, Cl. 423-223.000.

Metelyagin, Alexandr Z.: *See—*
Varlamov, Vladimir M.; Sopin, Anatoly I.; Judaev, Vasily F.; Romanov, Jury P.; Kokarev, Dmitry T.; Metelyagin, Alexandr Z.; Shestakov, Vladislav A.; Fomin, Vladimir I.; and Filin, Vladimir A., 4,136,971, Cl. 366-169.000.

Meteor AG: *See—*
Zdrahal, Pavel, 4,136,570, Cl. 74-34.000.

Metrailer, William J.: *See—*
Allan, David E.; Lewis, William E.; and Metrailer, William J., 4,137,149, Cl. 208-93.000.

Mettler Instrumente AG: *See—*
Strickler, Ernst, 4,136,750, Cl. 177-189.000.

Mettoy Company Limited, The: *See—*
Nicholls, Bryan F., 4,136,481, Cl. 46-22.000.

Meyer, Jarold A., to Chevron Research Company. Two-stage hydroconversion process (hydrocracking and reforming) using a stabilized aluminosilicate hydrocracking catalyst. 4,137,146, Cl. 208-60.000.

Meyer, Paul, to Frenkel C-D Aktiengesellschaft. Mixing apparatus. 4,136,969, Cl. 366-88.000.

Meyer, Richard C.: *See—*
Klein, Gerald L.; and Meyer, Richard C., 4,136,953, Cl. 356-339.000.

Meyers, Michael R.; Langieri, Michael; and Cook, Calvin, to Louis Marx & Co., Inc. Rotary table ball game. 4,136,871, Cl. 273-85.00A.

Michail, Michel S.: *See—*
Albrecht, Drew E.; Doran, Samuel K.; Michail, Michel S.; and Yourke, Hannon S., 4,137,459, Cl. 250-492.00A.

Microlife Technics, Inc.: *See—*
Franklin, Alfred A., Jr.; and McLeod, Ian C., 4,136,486, Cl. 47-58.000.

Middleton, John R., to M.S. Precision Products Limited. Collapsible trolley. 4,136,889, Cl. 280-30.000.

Midland-Ross Corporation: *See—*
Schultz, Forrest O. E., 4,137,492, Cl. 320-1.000.

Migrin, Robert S.; and Olson, Jerry A., to Eaton Corporation. Variable geometry fluid flowmeter. 4,136,565, Cl. 73-212.000.

Mikhailov, Sergei K.: *See—*
Barbashin, Oleg A.; Okunev, Alexandr A.; Mikhailov, Sergei K.; Mochalov, Lev E.; Orlov, Lev P.; Shenderov, Lev B.; Shelepov, Nikolai S.; Dubodin, Vissarion M.; Vladimirov, Alexandr S.; and Gorynin, Igor V., 4,137,422, Cl. 13-9.00R.

Miki, Yoshio; Nishizawa, Hideo; and Suzuki, Yukio, to Nitto Electric Industrial Co., Ltd. Pressure sensitive adhesive tapes. 4,137,362, Cl. 428-337.000.

Mikulicz, Michael Z.; and Burton, Vance P., to UPO Inc. Process for motor fuel production by olefin polymerization. 4,137,274, Cl. 260-683.15C.

Miller Brothers: *See—*
Miller, Norman K., 4,137,116, Cl. 156-269.000.

Miller, Douglas C., to Philip Morris Incorporated. Error-detection system for packaging of articles and encoded container blank therefor. 4,136,503, Cl. 53-507.000.

Miller Harness Company: *See—*
Miller, Jacob, 4,136,506, Cl. 54-66.000.

Miller, Jacob, to Miller Harness Company. Saddle pad. 4,136,506, Cl. 54-66.000.

Miller, Maurice L., Jr.: *See—*
Clark, Gary E., 4,136,791, Cl. 214-85.000.

Miller, Norman K., to Miller Brothers. Method of making a pressure switch. 4,137,116, Cl. 156-269.000.

Miller, Roland E.; Scaletta, Joseph A.; and Valek, John, to Kraft, Inc. Apparatus for seaming a lid to a container pan. 4,136,627, Cl. 113-18.00A.

Miller, Russell C., to J. M. Eltzroth & Associates, Inc. Coating compositions and processes. 4,137,368, Cl. 428-461.000.

Milliken Research Corporation: *See—*
Farmer, Larry B., 4,137,243, Cl. 260-378.000.

Minnesota Mining and Manufacturing Company: *See—*
Kanten, Thomas M., 4,137,342, Cl. 427-127.000.

Minolta Camera Kabushiki Kaisha: *See—*
Iizaka, Isao; and Miyamoto, Osamu, 4,136,944, Cl. 355-10.000.

Miquel, Jean: *See—*
Franck, Jean-Pierre; Freund, Edouard; Marcilly, Christian; and Miquel, Jean, 4,137,147, Cl. 208-61.000.

Miranol Chemical Company, Inc., The: *See—*
Christiansen, Arvid, 4,137,245, Cl. 260-404.500.

Miserlis, Constantine D.; and Lewis, Peter J., to Badger Company, Inc., The. Equipment for handling spent-aqueous Ziegler type catalyst in the polymerization of olefins. 4,137,387, Cl. 526-62.000.

Mitchell, David S.; and Sageman, David R., to Chevron Research Company. Gasification process. 4,137,053, Cl. 48-197.00R.

Mitchell, Julian M.: *See—*
Blaskiewicz, Arthur A.; and Mitchell, Julian M., 4,137,350, Cl. 428-31.000.

Mititada, Morisue: *See—*
Komamiya, Yasuo; Tateno, Hiroshi; Kataoka, Shoei; and Mititada, Morisue, 4,137,569, Cl. 364-784.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Tachino, Kenzo, 4,136,758, Cl. 187-29.00R.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Takahashi, Akira, 4,136,649, Cl. 123-103.00R.

Mitsubishi Jukogko Kabushiki Kaisha: *See—*
Ishida, Michiyasu, 4,136,409, Cl. 5-91.000.

Mitsubishi Paper Mills, Ltd.: *See—*
Koike, Takashi; and Amano, Masahiro, 4,137,046, Cl. 8-192.000.

Mitsui Engineering & Shipbuilding Co., Ltd.: *See—*
Nojiri, Michihiko; Watanabe, Tatsuo; and Matsuo, Kazuyoshi, 4,137,285, Cl. 261-93.000.

Mitsui, Seiji: *See—*
Endo, Akira; Terahara, Akira; Kitano, Noritoshi; Ogiso, Akira; and Mitsui, Seiji, 4,137,322, Cl. 424-273.00R.

Mitsuo, Masaru; and Isayama, Sigeharu, to Toyo Press Co., Ltd.; and Matsushita Electric Industrial Co., Ltd. Toaster with bi-metal controls. 4,136,607, Cl. 99-329.00R.

Miyai, Akira: *See—*
Ishii, Masaji; Watanabe, Shuzo; Miyai, Akira; and Hiraoka, Hideo, 4,137,476, Cl. 313-336.000.

Miyake, Tetsuya; Takeda, Kunihiko; Miyata, Naoki; Saeki, Tatsushi; and Seko, Maomi, to Asahi Kasei Kogyo Kabushiki Kaisha. Purification of formaldehyde by separation. 4,137,054, Cl. 55-33.000.

Miyamoto, Osamu: *See—*
Iizaka, Isao; and Miyamoto, Osamu, 4,136,944, Cl. 355-10.000.

Miyata, Naoki: *See—*
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Miyazawa, Kokichi: *See*—
Nagata, Koichi; Miyazawa, Kokichi; Sato, Takeshi; Tsuchimoto, Masashi; and Kawashima, Junichi, 4,137,293, Cl. 423-140.000.
Mizuno, Kazuhiro: *See*—
Komai, Takeshi; Matsuyama, Kazuo; and Mizuno, Kazuhiro, 4,137,252, Cl. 260-463.000.
Mobil Oil Corporation: *See*—
Audeh, Costandi A., 4,137,154, Cl. 208-254.00R.
Chester, Arthur W.; Schwartz, Albert B.; and Stover, William A., 4,137,152, Cl. 208-120.000.
Chu, Chin-Chiun, 4,137,195, Cl. 252-437.000.
Gillespie, Bernard M.; Sarli, Michael S.; and Smith, Kenneth W., 4,137,148, Cl. 208-87.000.
Mochalov, Lev E.: *See*—
Barbashin, Oleg A.; Okunev, Alexandr A.; Mikhailov, Sergei K.; Mochalov, Lev E.; Orlov, Lev P.; Shenderov, Lev B.; Shelepov, Nikolai S.; Dubodin, Vissarion M.; Vladimirov, Alexandr S.; and Gorynin, Igor V., 4,137,422, Cl. 13-9.00R.
Moertel, George B., to Textron, Inc. Apparatus for manufacturing of trains of slide fastening elements. 4,137,034, Cl. 425-545.000.
Mohri, Michihiro; Takeda, Hiroo; Tsunemi, Masaaki; Uchiumi, Tadashi; and Kanda, Takeshi, to Nippon Oil Company, Ltd. Method for treating waste waters. 4,137,162, Cl. 210-40.000.
Moked, Isaac; Handwerk, Richard H.; and Marshall, Walter R., to Union Carbide Corporation. Low energy recovery compounding and fabricating apparatus for plastic materials. 4,137,023, Cl. 418-15.000.
Molander, Bo: *See*—
Holmqvist, Goran; Molander, Bo; and Wicklund, Jan, 4,136,721, Cl. 141-11.000.
Moller, Manfred: *See*—
Althoff, Jurgen; Jager, Kurt; Lommel, Heinz; Moller, Manfred; and Potzschke, Manfred, 4,137,102, Cl. 148-31.500.
Molyneux, George, to Radway Plastics Limited. Structural elements for sub-frames. 4,136,496, Cl. 52-302.000.
Monsanto Company: *See*—
Hedrick, Ross M., 4,137,083, Cl. 106-20.000.
Sidebotham, Norman C.; Shoemaker, Paul D.; and Young, Clarence W., III, 4,137,393, Cl. 528-491.000.
Monsanto Research Corporation: *See*—
Ball, George L., III; Werkmeister, Dennis W.; and Salyer, Ival O., 4,137,364, Cl. 428-412.000.
Monteith, Larry K.: *See*—
Wortman, Jimmie J.; Whisnant, Richard A.; and Monteith, Larry K., 4,136,778, Cl. 209-589.000.
Mooney Chemicals, Inc.: *See*—
Bak, Eugene; and Collins, Albert V., 4,137,359, Cl. 428-295.000.
Moore, Alan R., to Lucas Industries Limited. Multiphase full-wave rectifier assembly. 4,137,560, Cl. 363-145.000.
Moore Business Forms, Inc.: *See*—
Traise, John E., 4,137,528, Cl. 340-675.000.
Moore, Eugene R.; Briggs, Roger L.; McDonald, David C.; and Hoffman, Richard, to Dow Chemical Company, The. Process for making pure salicylic acid. 4,137,258, Cl. 562-477.000.
Moore, Ralph G. D.: *See*—
Brodsky, Lee D.; Moskowitz, Mark L.; and Moore, Ralph G. D., 4,137,226, Cl. 260-140.000.
Morey, Booker W.; and Rudy, Samuel, to Occidental Petroleum Corporation. Separation of non-magnetic conductive metals. 4,137,156, Cl. 209-212.000.
Morgan, Alan W. Highway marker. 4,136,990, Cl. 404-9.000.
Morgan, Homer R. Tailgate construction. 4,136,905, Cl. 296-50.000.
Mori, Akiyoshi: *See*—
Nashiwa, Hajime; Mori, Akiyoshi; and Kitagawa, Yoshiyasu, 4,137,104, Cl. 148-36.000.
Morita, Kaneji; Sugie, Akio; and Ishioka, Kunio, to Yamamura Glass Kabushiki Kaisha; and Junzo Shimoiizaka. Method and apparatus for breaking up and separating waste glass to obtain cullet. 4,136,832, Cl. 241-91.000.
Morita, Yoshiyuki: *See*—
Tanaka, Keigo; and Morita, Yoshiyuki, 4,136,657, Cl. 123-140.00R.
Morrison, William M. M. Countershaft gear boxes. 4,136,574, Cl. 74-359.000.
Morrow, Gary R.; and Dargitz, Larry L., to Skagit Corporation. Logging system and yarder therefor. 4,136,786, Cl. 212-76.000.
Morrow, James G., Sr.; Pech, David J.; and Hunter, Charles A., II, to Manitowoc Company Inc., The. Hoist drum drive control. 4,136,855, Cl. 254-150.0FH.
Morton-Norwich Products, Inc.: *See*—
White, Ralph L., Jr.; and Wright, George C., 4,137,402, Cl. 542-420.000.
Moseley Rubber Company Limited, The: *See*—
Kenyon, Jack; and Heaton, Herbert M., 4,137,167, Cl. 210-81.000.
Moser, Peter: *See*—
Defago, Raymond; Koller, Stefan; and Moser, Peter, 4,137,042, Cl. 8-2.50A.
Moskowitz, Mark L.: *See*—
Brodsky, Lee D.; Moskowitz, Mark L.; and Moore, Ralph G. D., 4,137,226, Cl. 260-140.000.
Motorola, Inc.: *See*—
Bailey, William L.; Coleman, Michael G.; Harris, Cynthia B.; and Lesk, Israel A., 4,137,123, Cl. 156-647.000.
Reynolds, Reese M., 4,137,250, Cl. 260-455.00R.
Motyka, Jerry J.: *See*—
Tobias, Lamar K.; and Motyka, Jerry J., 4,136,803, Cl. 222-413.000.
Moustakas, Matthew A.: *See*—
Fabricant, Norman; and Moustakas, Matthew A., 4,136,480, Cl. 46-17.000.
Mrdjenovich, Robert, to Ford Motor Company. Low cost method of fluidizing cupola slag (A). 4,137,071, Cl. 75-30.000.
Mueller, Frederick N.; and Chandler, Ronald W., to Tetradyne Corporation. Apparatus for automatically sensing and recording data in a sewage system. 4,136,561, Cl. 73-171.000.
Mueller, Frederick N.; and Chandler, Ronald W., to Tetradyne Corporation. Digital volumetric flow rate measurement of a flowing fluid. 4,136,563, Cl. 73-194.00E.
Muether, Manfred: *See*—
Guenther, Werner; Stueber, Franz; Muether, Manfred; and Kratochwilla, Hans-Michael, 4,136,450, Cl. 32-22.000.
Mukai, Kunio: *See*—
Satomi, Takeo; Hino, Naganori; Hirano, Masachika; Mukai, Kunio; Sakamoto, Hideo; and Yoshida, Ryo, 4,137,065, Cl. 71-87.000.
Mukaiyama, Fumiaki, to Kabushiki Kaisha Suwa Seikosha. Digital display driving circuit. 4,137,523, Cl. 340-813.000.
Muller, Alois, to Kronseder, Hermann. Device for attaching specifically tapelike cuts to containers. 4,137,121, Cl. 156-571.000.
Muller, Heinz: *See*—
Kraus, Helmut; Muller, Heinz; Huber, Hans; and Ruchlak, Kasimir, 4,137,381, Cl. 526-3.000.
Muller, Marcel: *See*—
Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; Kieslich, Klaus; and Wiechert, Rudolf, 4,137,269, Cl. 260-586.00E.
Mullerheim, Steven B.; and Williams, Fred G., Jr., to Great Circle Associates. Filtration with a compostable filter medium. 4,137,062, Cl. 71-9.000.
Mulock Houwer, Johan H., to B.V. Koninklijke Maatschappij "De Schelde". Conveying, storage and sorting system for large metal sheets, particularly for use in shipbuilding. 4,136,789, Cl. 214-16.00B.
Munschy, Dorothy G. Footwear. 4,136,468, Cl. 36-97.000.
Murai, Hiromu; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, to Nippon Shinyaku Co., Ltd. Process for the isolation of 2-hydroxymethyl-3,4,5-trihydroxypiperidine from plant material. 4,137,231, Cl. 546-242.000.
Murakami, Masuo; Takahashi, Kozo; and Ozasa, Teruaki, to Yamanouchi Pharmaceutical Co., Ltd. Process of preparing cephalosporanic acid ester derivatives. 4,137,407, Cl. 544-28.000.
Muraoka, Teruo; and Seki, Kohji, to Victor Company of Japan, Ltd. System for recording a signal with tracing and tracking distortion compensation on a record disc. 4,137,430, Cl. 179-100.40C.
Murayama, Naohiro: *See*—
Yoshida, Masafumi; and Murayama, Naohiro, 4,137,475, Cl. 310-323.000.
Murdock, Robert H., to Custom Automatic. Sound attenuating structure. 4,136,856, Cl. 256-24.000.
Murray, Carl F. Window shade and curtain rod bracket plate. 4,136,847, Cl. 248-256.000.
Murray, Kenneth M., to United States of America, Navy. Photographic image enhancement by photofission. 4,137,461, Cl. 250-526.000.
Mushenko, Nikolai Y.; KLarin, Gennady P.; Seredenko, Vladimir P.; and Svetikov, Ivan P. Oxygen-fuel cutting torch. 4,136,827, Cl. 239-419.300.
Musselman, Lawrence L.; Harbottle, William E.; and Berecek, Joseph P., to Timken Company, The. Unitized single row tapered roller bearing. 4,136,916, Cl. 308-213.000.
Muzzio, John A., to BASF Wyandotte Corporation. Process for the removal of catalyst from polyether polyol. 4,137,398, Cl. 536-4.000.
Naastepad, Pieter A.: *See*—
Asselman, George A. A.; Green, David B.; Castelijns, Adrianus P. J.; Naastepad, Pieter A.; and de Ruiter, Jacob W., 4,136,733, Cl. 165-32.000.
Nabiullin, Faat K.; Gertsik, Efim M.; Rabinovich, Vyacheslav A.; Soldatenko, Vladimir A.; and Rodionov, Jury T. Device for sealing current sources of cylindrical shape with alkali electrolyte. 4,136,443, Cl. 29-731.000.
Nagano, Akio: *See*—
Watanabe, Akinori; Nagano, Akio; and Tanoshima, Katsuhide, 4,136,611, Cl. 101-1.000.
Nagano, Shojiro: *See*—
Ito, Mikiji; Naganuma, Naohiro; and Nagano, Shojiro, 4,137,020, Cl. 417-534.000.
Naganuma, Naohiro: *See*—
Ito, Mikiji; Naganuma, Naohiro; and Nagano, Shojiro, 4,137,020, Cl. 417-534.000.
Nagaoka, Mitsuo: *See*—
Nakamura, Norio; Tominaga, Satoshi; Kobayashi, Tsuneo; and Nagaoka, Mitsuo, 4,137,090, Cl. 106-106.000.
Nagata, Koichi; Miyazawa, Kokichi; Sato, Takeshi; Tsuchimoto, Masashi; and Kawashima, Junichi, to Ishihara Sangyo Kaisha, Ltd. Producing gypsum and magnetite from ferrous sulfate and separating. 4,137,293, Cl. 423-140.000.
Nagaya, Teruo: *See*—
Ueda, Tadao; Nagaya, Teruo; and Kawada, Koji, 4,137,136, Cl. 204-98.000.
Naik, Appaya R.; Todt, Klaus H.; and Wells, Martin A., to Lever Brothers Company. Fabric treatment materials. 4,137,180, Cl. 252-8.800.
Naitou, Takashi: *See*—
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,136,645, Cl. 123-32.0EE.

Nakahara, Masao: *See*—
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Nakahata, Kimio; and Tamura, Yasuyuki, to Canon Kabushiki Kaisha. Electrophotographic apparatus. 4,136,942, Cl. 355-3.0CH.

Nakamura, Norio; Tominaga, Satoshi; Kobayashi, Tsuneo; and Nagaoka, Mitsuo, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method for controlling operation of apparatus for preheating and calcining cement materials containing combustible materials. 4,137,090, Cl. 106-106.000.

Nakase, Takamichi: *See*—
Hattori, Tadashi; Nakase, Takamichi; and Yamaguchi, Hiroaki, 4,136,651, Cl. 123-119.0EC.

Nalco Chemical Company: *See*—
Leffelman, Victor C., 4,136,976, Cl. 366-336.000.

Namiki, Ryoichi, to Ricoh Company, Ltd. Fixing apparatus for electrostatic photography. 4,136,613, Cl. 118-60.000.

Napco Security Systems, Inc.: *See*—
Stockdale, Roy, 4,137,429, Cl. 179-5.00R.

Nascimento, Dennis F.: *See*—
Lenker, Don H.; Nascimento, Dennis F.; and Adrian, Paul A., 4,136,509, Cl. 56-327.00R.

Nashiwa, Hajime; Mori, Akiyoshi; and Kitagawa, Yoshiyasu, to Sumitomo Metal Industries, Ltd. As-rolled steel plate having improved low temperature toughness and production thereof. 4,137,104, Cl. 148-36.000.

National Distillers and Chemical Corporation: *See*—
Vetter, Clarence J., Jr., 4,137,382, Cl. 528-271.000.

National Research Development Corporation: *See*—
Elliott, Michael; Janes, Norman F.; and Pulman, David A., 4,137,324, Cl. 424-282.000.

National Starch and Chemical Corporation: *See*—
Sirota, Julius, 4,137,276, Cl. 260-830.00P.

National Telephone Supply Company, The: *See*—
Neale, Dory J., Sr., 4,136,441, Cl. 29-628.000.

Nauchno-Issledovatelsky Institut Avtomatizatsii Upravlenia I Proizvodstva Niiap: *See*—
Suslin, Vladimir I.; Makeev, Boris A.; Dubovik, Alexandr I.; Lekarev, Zinovy A.; Pilipenko, Vitaly A.; Etnaer, Alexandr I.; Kolesnichenko, Anatoly A.; and Razdymakha, Pavel S., 4,137,143, Cl. 204-224.00M.

NCR Corporation: *See*—
Reece, John W.; Italiano, Victor J.; and Crump, Leslie L., 4,137,513, Cl. 335-219.000.

Neale, Dory J., Sr., to National Telephone Supply Company, The. Apparatus and method for butt splicing wires. 4,136,441, Cl. 29-628.000.

Nees, John; and Bailey, Dale A., to General Battery Corporation. Calcium-strontium-lead grid alloy for use in lead-acid batteries. 4,137,378, Cl. 429-245.000.

Nehring, John R., to International Paper Company. Self-contained, combined irrigator and evacuator for wounds. 4,136,696, Cl. 128-278.000.

Neilson, William J.; and Rife, Dwight A., to Smith International, Inc. Method for constructing a multiple segment rock bit. 4,136,586, Cl. 76-108.00A.

Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Encapsulated measuring apparatus. 4,136,958, Cl. 356-169.000.

Nelson, Frank M.: *See*—
Mager, George E.; Nelson, Frank M.; Gillett, Kenneth; Holt, Charles P.; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; Criswell, Thomas; and Hall, Warren L., 4,137,565, Cl. 364-200.000.

Nemets, Rusaam S.: *See*—
Ignatiev, Alexei K.; Nemets, Rusaam S.; Gorbulev, Efim S.; Stolyarova, Elena N.; and Kontsov, Jury M., 4,136,718, Cl. 140-105.000.

Ness, Martin E., to Gulf & Western Industries, Inc. Method of forming tooling for superplastic metal sheet. 4,137,105, Cl. 148-11.50R.

Neumann, Dietrich: *See*—
Boeck, Joachim; Dunker, Peter; Fryen, Jurgen; Neumann, Dietrich; Pattberg, Georg; and Wieseke, Udo, 4,137,562, Cl. 364-200.000.

New Hermes, Incorporated: *See*—
Levine, Jack W., 4,136,453, Cl. 33-21.00R.

New World Products, Inc.: *See*—
Kent, Jerry B., 4,137,206, Cl. 260-29.60B.

Newcor, Inc.: *See*—
Field, Harry; Smith, Monte L.; Whitehead, Jas. A.; and Learn, Monroe E., 4,136,519, Cl. 60-369.000.

Newsom, Michael L.: *See*—
Daman, Lloyd W.; Marti, Don V., II; Newsom, Michael L.; and Shamp, Donald E., 4,137,037, Cl. 432-3.000.

Nicholls, Bryan F., to Mettoy Company Limited, The. Toy figures. 4,136,481, Cl. 46-22.000.

Niestroj, Heinrich; and Denz, Peter, to Schubert & Salzer. Method and device for automatically leveling fleeces, slivers, rovings and the like by drawing. 4,137,487, Cl. 318-39.000.

Nihon Beru-Haueru Kabushiki Kaisha (Bell & Howell Japan, Ltd.): *See*—
Abe, Masao, 4,136,939, Cl. 354-25.000.

Nijman, Willem; and de Waard, Peter J., to U.S. Philips Corporation. Method of manufacturing a semiconductor device utilizing selective masking, deposition and etching. 4,137,107, Cl. 148-171.000.

Nilsen, Walter. Method for making a reinforced wall or foundation. 4,136,499, Cl. 52-741.000.

Nilsson, Bengt E., to Lidkopings Mekaniska Verkstads AB. Device for incremental feed in a machine tool. 4,136,572, Cl. 74-125.500.

Nimchuk, Allan. Portable sail structures. 4,136,631, Cl. 114-103.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Iwamatsu, Masayuki; and Yokoyama, Kenji, 4,137,506, Cl. 330-288.000.
Iyeta, Motoi, 4,136,884, Cl. 274-37.000.

Nippon Oil Company, Ltd.: *See*—
Mohri, Michihiro; Takeda, Hiroo; Tsunemi, Masaaki; Uchiumi, Tadashi; and Kanda, Takeshi, 4,137,162, Cl. 210-40.000.
Otsuki, Yutaka; Horii, Hideo; and Araki, Yoshihiko, 4,137,282, Cl. 260-879.000.

Nippon Oil and Fats Co., Ltd.: *See*—
Komai, Takeshi; Matsuyama, Kazuo; and Mizuno, Kazuhiro, 4,137,252, Cl. 260-463.000.

Nippon Shinyaku Co., Ltd.: *See*—
Murai, Hiromu; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, 4,137,231, Cl. 546-242.000.

Nippon Soken, Inc.: *See*—
Hattori, Tadashi; Nakase, Takamichi; and Yamaguchi, Hiroaki, 4,136,651, Cl. 123-119.0EC.

Nippondenso Co., Ltd.: *See*—
Ito, Mikiji; Naganuma, Naohiro; and Nagano, Shojiro, 4,137,020, Cl. 417-534.000.
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,136,645, Cl. 123-32.0EE.
Sugiura, Akio; Okamoto, Atutoshi; and Nojiri, Tadao, 4,136,821, Cl. 235-462.000.
Tanaka, Keigo; and Morita, Yoshiyuki, 4,136,657, Cl. 123-140.00R.
Tokitsu, Naoki; and Saito, Muneo, 4,137,553, Cl. 360-6.000.

Nishihara Environmental Sanitation Research Corporation Limited: *See*—
Shoda, Yoshikazu, 4,137,177, Cl. 210-403.000.

Nishimoto, Kanichi, to Noritsu Koki Co., Ltd. Photographic printer and associated processor. 4,136,946, Cl. 355-28.000.

Nishizawa, Hideo: *See*—
Miki, Yoshio; Nishizawa, Hideo; and Suzuki, Yukio, 4,137,362, Cl. 428-337.000.

Nissan Motor Company, Limited: *See*—
Sakaki, Yoshihiro, 4,136,729, Cl. 165-9.000.
Suzuki, Suzuo; Kawamura, Yoshihisa; and Ezoe, Mitsuhiko, 4,136,564, Cl. 73-194.00F.
Tanaka, Shigenori; Tojo, Akio; and Honya, Takao, 4,136,716, Cl. 139-435.000.
Usui, Keizaburo; and Hayama, Isao, 4,136,576, Cl. 74-473.00R.

Nist, Eugene M., to Seattle Box Co. Round-nose frame joint. 4,136,988, Cl. 403-231.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Miki, Yoshio; Nishizawa, Hideo; and Suzuki, Yukio, 4,137,362, Cl. 428-337.000.

Noble, Mark A.: *See*—
Nobles, Phillip C.; and Noble, Mark A., 4,136,539, Cl. 70-18.000.

Nobles, Phillip C.; and Noble, Mark A. Heavy equipment lock. 4,136,539, Cl. 70-18.000.

Nogami, Tomoyuki; and Tsubouchi, Kaoru, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Aisin Seiki Kabushiki Kaisha. Sealed reservoir for brake master cylinder. 4,136,712, Cl. 137-558.000.

Nojiri, Michihiko; Watanabe, Tatsuo; and Matsuo, Kazuyoshi, to Mitsui Engineering & Shipbuilding Co., Ltd. Gas-liquid contact apparatus. 4,137,285, Cl. 261-93.000.

Nojiri, Tadao: *See*—
Sugiura, Akio; Okamoto, Atutoshi; and Nojiri, Tadao, 4,136,821, Cl. 235-462.000.

Nolan, Damon P.; Nolan, Damon P., II; and Nolan, Kevin T., to Nolan, Damon P.; Nolan, Damon P., II; and Nolan, Kevin T. Radiant heat paint spray chamber. 4,136,463, Cl. 34-39.000.

Nolan, Damon P., II: *See*—
Nolan, Damon P.; Nolan, Damon P., II; and Nolan, Kevin T., 4,136,463, Cl. 34-39.000.

Nolan, Kevin T.: *See*—
Nolan, Damon P.; Nolan, Damon P., II; and Nolan, Kevin T., 4,136,463, Cl. 34-39.000.

Noorlander, Daniel O., to I.B.A. Inc. Vacuum and pulsator automatic shutoff for a claw. 4,136,639, Cl. 119-14.550.

Noranda Mines Limited: *See*—
Rosenblum, Frank, 4,136,567, Cl. 73-438.000.

Nordisk Fjerfabrik Aktieselskab: *See*—
Hansen, Sigurd S., 4,137,111, Cl. 156-65.000.

Nordstrom, John D.; and Peng, Stephen C., to Ford Motor Company. Powder paint with epoxy and amide copolymer with carboxy terminated crosslinking agent. 4,137,277, Cl. 260-835.000.

Noritsu Koki Co., Ltd.: *See*—
Nishimoto, Kanichi, 4,136,946, Cl. 355-28.000.

Norris, John W. Intraocular lens with attached disposable instrument. 4,136,406, Cl. 3-13.000.

Norsk Hydro A.S.: *See*—
Skaadel, Johannes; and Omdal, Bjarne, 4,136,723, Cl. 150-1.000.

Northern Telecom Limited: *See*—
Crompton, Eric J.; Poissant, Serge; and Fordyce, Ian, 4,137,426, Cl. 178-46.000.

Northup, Edwin M.: *See*—
Coleman, Martin W.; and Northup, Edwin M., 4,136,508, Cl. 56-208.000.

Novotny, Pavel; and Fiala, Ludvik, to CKD DUKLA, narodni podnik.

Method of and apparatus for regulating steam and hot water boilers employing fluidized fuel. 4,136,642, Cl. 122-4.00D.

NRG Incorporated: *See—*
Bradford, Rolland H.; Laylander, Paul V.; and Baranyi, Anthony J., 4,136,493, Cl. 52-169.700.

Nunlist, Rene: *See—*
Aeschlimann, Heinz; Nunlist, Rene; and Stocker, Rudolf, 4,136,955, Cl. 356-152.000.

Nuss, George W., Jr.: *See—*
Klein, Robert W.; and Nuss, George W., Jr., 4,137,311, Cl. 424-240.000.

Obenshain, David N., to Westvaco Corporation. Sheet stacking device. 4,136,864, Cl. 271-217.000.

Oberauer, Georg: *See—*
Sulzbach, Reinhard A.; and Oberauer, Georg, 4,137,055, Cl. 55-71.000.

Oberstein, Nathan. Flushable bedpan bag. 4,136,798, Cl. 220-408.000.

O'Brien, Edward F.: *See—*
Putnam, Roger L., Jr.; Shultz, Richard H.; and O'Brien, Edward F., 4,136,505, Cl. 53-551.000.

Occidental Petroleum Corporation: *See—*
Morey, Booker W.; and Rudy, Samuel, 4,137,156, Cl. 209-212.000.

Ocean Systems, Inc.: *See—*
Day, John T.; Herder, Robert O.; Blockwick, Thomas N.; Brockman, Dan B.; Sharpe, John F.; and Hildebrand, Richard W., 4,136,632, Cl. 114-220.000.

Ochi, Masafumi; Masui, Motonobu; and Iwai, Ikuo, to Iwasaki Electric Co., Ltd. High pressure discharge lamp with a starting circuit contained therein. 4,137,483, Cl. 315-74.000.

O'Connor, Michael N. D.: *See—*
Coscia, Anthony T.; and O'Connor, Michael N. D., 4,137,164, Cl. 210-54.000.
Coscia, Anthony T.; and O'Connor, Michael N. D., 4,137,165, Cl. 210-54.000.

Odawara, Youji: *See—*
Ishida, Masahiko; Haga, Ryooichi; and Odawara, Youji, 4,137,158, Cl. 210-16.000.

Odza, Besir; and Spector, George. Domain game with elastic piece retention. 4,136,882, Cl. 273-264.000.

Oesterreichisch-Amerikanische Magnesit Aktiengesellschaft: *See—*
Gerstl, Rudolf, 4,137,026, Cl. 425-78.000.

Ofstead, Eilert A., to Goodyear Tire & Rubber Company, The. Process for the polymerization of cycloolefins. 4,137,390, Cl. 526-143.000.

Ogiso, Akira: *See—*
Endo, Akira; Terahara, Akira; Kitano, Noritoshi; Ogiso, Akira; and Mitsui, Seiji, 4,137,322, Cl. 424-273.00R.

Ogura, Katsuyuki: *See—*
Tsuchihashi, Genichi; Ogura, Katsuyuki; Yaso, Masao; Kuramoto, Masashi; Fujii, Tadashiro; and Watanabe, Tetsuo, 4,137,406, Cl. 544-27.000.

Ohkita, Masao: *See—*
Sato, Hidetoshi; and Ohkita, Masao, 4,137,438, Cl. 200-153.00H.

Ohshiro, Takeshi: *See—*
Funakoshi, Satoshi; Omura, Takao; and Ohshiro, Takeshi, 4,137,307, Cl. 424-177.000.

Ohta, Masafumi, to Ricoh Company, Ltd. 1,3,7-Trinitrophenazine-5-oxide. 4,137,413, Cl. 544-348.000.

Ohya, Yoshinobu: *See—*
Harada, Yuichi; and Ohya, Yoshinobu, 4,137,366, Cl. 428-425.000.

Okada, Toru: *See—*
Torita, Tomohiko; Okada, Toru; and Yokota, Yuji, 4,136,819, Cl. 235-431.000.

Okamoto, Atutoshi: *See—*
Sugiura, Akio; Okamoto, Atutoshi; and Nojiri, Tadao, 4,136,821, Cl. 235-462.000.

Okazaki, Haruhiko: *See—*
Sakakibara, Takao; and Okazaki, Haruhiko, 4,137,349, Cl. 427-380.000.

Oki Electric Industry Co., Ltd.: *See—*
Watanabe, Akinori; Nagano, Akio; and Tanoshima, Katsuhide, 4,136,611, Cl. 101-1.000.

Okuda, Hiroji, to Koyo Seiko Company Limited. Drive shaft. 4,136,532, Cl. 64-23.000.

Okuda, Hiroji, to Koyo Seiko Company Limited. Drive apparatus for rolling rolls. 4,136,533, Cl. 64-23.000.

Okumura, Hiroshi: *See—*
Kuwabara, Takao; and Okumura, Hiroshi, 4,137,004, Cl. 415-1.000.

Okunev, Alexandr A.: *See—*
Barbashin, Oleg A.; Okunev, Alexandr A.; Mikhailov, Sergei K.; Mochalov, Lev E.; Orlov, Lev P.; Shenderov, Lev B.; Shelepov, Nikolai S.; Dubodin, Vissarion M.; Vladimirov, Alexandr S.; and Gorynin, Igor V., 4,137,422, Cl. 13-9.00R.

Olausson, Gun A.: *See—*
Af Ekenstam, Bo T.; Aurell, Leif E.; Claeson, Karl G.; Karlsson, Birgitta G.; Gustavsson, Stig I.; and Olausson, Gun A., 4,137,225, Cl. 260-112.50R.

Olin Corporation: *See—*
Cassata, John R., 4,137,266, Cl. 260-578.000.

Olshansky, Leonard: *See—*
Tennenhouse, Clifford C.; and Olshansky, Leonard, 4,137,527, Cl. 340-620.000.

Olson, Jerry A.: *See—*
Migrin, Robert S.; and Olson, Jerry A., 4,136,565, Cl. 73-212.000.

Olsson, Gunnar. Method of stabilizing ground of low bearing capacity, and a stabilizing unit for carrying out the method. 4,136,992, Cl. 404-76.000.

Olszewski, Jerzy A.: *See—*
Huang, Yung-Yien; Olszewski, Jerzy A.; and Sarkar, Arnab, 4,136,960, Cl. 356-239.000.

Olympus Optical Co., Ltd.: *See—*
Maitani, Yoshihisa, 4,137,539, Cl. 354-152.000.

Omdal, Bjarne: *See—*
Skaadel, Johannes; and Omdal, Bjarne, 4,136,723, Cl. 150-1.000.

Omura, Takao: *See—*
Funakoshi, Satoshi; Omura, Takao; and Ohshiro, Takeshi, 4,137,307, Cl. 424-177.000.

Ono, Koichi; Takahara, Toshiyuki; and Ito, Tetsuyoshi, to Daicel Ltd. Gas generator for inflatable vehicle safety bags. 4,136,894, Cl. 280-729.000.

Onopchenko, Anatoli: *See—*
Bacha, John D.; Onopchenko, Anatoli; and Schulz, Johann G. D., 4,137,419, Cl. 562-408.000.

Opalka, Chester J., Jr.: *See—*
Lesher, George Y.; Opalka, Chester J., Jr.; Lesher, George Y.; and Opalka, Chester J., Jr., 4,137,233, Cl. 546-257.000.
Lesher, George Y.; Opalka, Chester J., Jr.; Lesher, George Y.; and Opalka, Chester J., Jr., 4,137,233, Cl. 546-257.000.

Optel Corporation: *See—*
Chen, Schoen-nan; and Harrison, Kenneth J., 4,137,524, Cl. 340-765.000.

Optical Business Machines, Inc.: *See—*
Bellinger, James E., Jr.; and MacNeill, John H., 4,136,978, Cl. 400-124.000.

Orlov, Lev P.: *See—*
Barbashin, Oleg A.; Okunev, Alexandr A.; Mikhailov, Sergei K.; Mochalov, Lev E.; Orlov, Lev P.; Shenderov, Lev B.; Shelepov, Nikolai S.; Dubodin, Vissarion M.; Vladimirov, Alexandr S.; and Gorynin, Igor V., 4,137,422, Cl. 13-9.00R.

O'Rourke, John D.; and Flockencier, Stuart W., to Chrysler Corporation. Means and method for imparting stabilization error to the line of sight of a simulator. 4,136,467, Cl. 35-25.000.

Ortman, Howard J.: *See—*
Christner, Willis D.; and Ortman, Howard J., 4,136,800, Cl. 221-1.000.

Osada, Yoshihito: *See—*
Tsuchida, Eishun; and Osada, Yoshihito, 4,137,217, Cl. 260-837.00R.

Osborne, Raymond B.: *See—*
Ireland, Alfred L.; and Osborne, Raymond B., 4,136,906, Cl. 296-137.00C.

Osman, Maged A.; and Scheffer, Terry J., to BBC Brown, Boveri & Company, Limited. Utilization of dyes for liquid crystal displays. 4,137,193, Cl. 252-299.000.

Osteen, Mitchell M., to General Electric Company. Color improvement of high pressure sodium vapor lamps by pulsed operation. 4,137,484, Cl. 315-209.00R.

Ostling, Sture, to SKF Nova AB. Bearing housing. 4,136,914, Cl. 308-15.000.

Otsuki, Yutaka; Horii, Hideo; and Araki, Yoshihiko, to Nippon Oil Company, Ltd. Process for producing water-dispersible film-forming material. 4,137,282, Cl. 260-879.000.

Ott, Anton: *See—*
Winter, August; and Ott, Anton, 4,136,581, Cl. 74-689.000.

Ours, Pierre L. Method of making a unitary lightweight outer garment. 4,137,114, Cl. 156-251.000.

Outdoor Enterprises of America, Inc.: *See—*
Comstock, Walter F., 4,137,005, Cl. 415-2.000.

Ovshinsky, Stanford R.: *See—*
Izu, Masatsuga; and Ovshinsky, Stanford R., 4,137,078, Cl. 96-27.00E.

Owen, Ronald C., to Illinois Tool Works Inc. Article carrier and method of making same. 4,136,771, Cl. 206-150.000.

Owens-Corning Fiberglas Corporation: *See—*
Wong, Robert; and Flautt, Martin C., 4,137,209, Cl. 260-29.6NR.

Owens-Illinois, Inc.: *See—*
Bieringer, Robert J., 4,136,779, Cl. 209-524.000.
Dickson, Andrew C.; and Kontz, Robert F., 4,137,031, Cl. 425-393.000.
Mallory, James D.; and Kirkman, Richard T., 4,137,061, Cl. 65-232.000.

Owsen, Paul J., to Century Specialties, Inc. Floating head checking fixture. 4,136,455, Cl. 33-147.00F.

Oy Kontekla: *See—*
Ebeling, Olavi A.; and Lunden, Risto W., 4,136,691, Cl. 128-212.000.

Oy W. Rosenlew Ab.: *See—*
Suominen, Jorma; Candolin, Carl-Johan; and Ronnholm, Arvi, 4,137,134, Cl. 203-73.000.

Oya, Masayuki: *See—*
Fujita, Tadashi; Oya, Masayuki; Takashina, Hideo; and Iso, Tadashi, 4,137,420, Cl. 562-426.000.

Ozasa, Teruaki: *See—*
Murakami, Masuo; Takahashi, Kozo; and Ozasa, Teruaki, 4,137,407, Cl. 544-28.000.

P. R. Mallory & Co. Inc.: *See—*
Mallory, Henry R., 4,136,438, Cl. 29-623.200.
Scott, Charles E.; and Small, James E., 4,137,463, Cl. 307-141.000.

Paap, Hans J.; Arnold, Dan M.; and Scott, Hubert D., to Texaco, Inc. Method of measuring horizontal fluid flow in cased off subsurface formations with manganese compensation. 4,137,452, Cl. 250-270.000.

Package Machinery Company: *See*—
Putnam, Roger L., Jr.; Shultz, Richard H.; and O'Brien, Edward F., 4,136,505, Cl. 53-551.000.
Page-Gibson, Joseph E.: *See*—
Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, 4,137,297, Cl. 423-561.00R.
Pallesen, Hugo B. Cable connector for hearing aids. 4,137,431, Cl. 179-107.00H.
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., to Stauffer Chemical Company. Herbicide compositions. 4,137,070, Cl. 71-100.000.
Palmer, Howard J.; and Bechard, James R. Oil pressure failure protection device for internal combustion engines. 4,136,660, Cl. 123-198.0DC.
Palmer, Stephen L.: *See*—
Friesen, Larry D.; and Palmer, Stephen L., 4,136,752, Cl. 180-101.000.
Palotsee, John J. Seal and propeller drive assembly for industrial cleaning tanks. 4,136,974, Cl. 366-283.000.
Panzer, Hans P.; and Acholonu, Kenny U., to American Cyanamid Company. Process for preparation of 2-vinylimidazolines. 4,137,415, Cl. 548-347.000.
Panzer, Hans P.; and Acholonu, Kenny U., to American Cyanamid Company. 2-Acylamidoethyl-2-imidazolines. 4,137,416, Cl. 548-353.000.
Papenfuhs, Theodor; and Gengnagel, Kurt, to Hoechst Aktiengesellschaft. Process for the manufacture of 2-alkoxy-6-bromo-naphthalenes. 4,137,272, Cl. 568-628.000.
Paris, Gerald Y.; Cimon, Denis G.; and Garmaise, David L., to Abbott Laboratories. Glycerides with antibacterial properties. 4,137,317, Cl. 424-256.000.
Parker-Hannifin Corporation: *See*—
Haluch, David A., 4,136,897, Cl. 285-342.000.
Parker Manufacturing Company: *See*—
Ewig, John F., Jr.; and Gardner, Jon S., 4,136,547, Cl. 72-391.000.
Parker, Sidney A., to Lennox Industries, Inc. Two speed compressor with rotor support structure. 4,137,014, Cl. 417-326.000.
Parkin, Claude E.: *See*—
Rogers, Philip W.; and Parkin, Claude E., 4,136,709, Cl. 137-375.000.
Parks, Noel W.: *See*—
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Parry, Richard J.: *See*—
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Partridge, John J., Jr.: *See*—
Chadha, Naresh K.; Partridge, John J., Jr.; and Uskokovic, Milan R., 4,137,244, Cl. 260-395.000.
Pastrick, Dan L.; and McDaniel, John M., to Zimmer U.S.A. Rotational offset knee prosthesis. 4,136,405, Cl. 3-1.911.
Patel, Mahesh G.: *See*—
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., 4,137,224, Cl. 260-112.50R.
Patelhold Patentverwertungs- & Holding AG: *See*—
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Patrick, John H.: *See*—
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Pattberg, Georg: *See*—
Boeck, Joachim; Dunker, Peter; Fryen, Jurgen; Neumann, Dietrich; Pattberg, Georg; and Wieseke, Udo, 4,137,562, Cl. 364-200.000.
Pattison, Victor A.: *See*—
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Patzke, Hans-Jurgen: *See*—
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Pavenick, Stanford. Replaceable cartridge for a dispenser. 4,136,801, Cl. 222-82.000.
Pawson, Beverly A.: *See*—
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Pearson, Christopher C.: *See*—
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Pease, William C., III: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Williams, Roy T.; and Pease, William C., III, 4,136,609, Cl. 100-51.000.
Pech, David J.: *See*—
Morrow, James G., Sr.; Pech, David J.; and Hunter, Charles A., II, 4,136,855, Cl. 254-150.0FH.
Pedain, Josef: *See*—
Wingler, Frank; Pedain, Josef; and Uerdingen, Walter, 4,137,389, Cl. 526-86.000.
Pedotti, Antonio. Apparatus particularly for evaluating the functionality of man locomotive faculties. 4,136,682, Cl. 128-2.00S.
Pell, Christopher, to Plessey Handel und Investments AG. Radar selective interrogation system. 4,137,531, Cl. 343-6.50R.
Peng, Stephen C.: *See*—
Nordstrom, John D.; and Peng, Stephen C., 4,137,277, Cl. 260-835.000.
Pennings, Albertus J.: *See*—
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Pennzoil Company: *See*—
Sardisco, John B., 4,137,063, Cl. 71-51.000.
Penrod, Evan P.; and West, Charles K. Adjustable dental bridge firing stand. 4,136,449, Cl. 32-2.000.
Pentapharm A.G.: *See*—
Stocker, Kurt F., 4,137,127, Cl. 195-66.00B.
Penzien, Klaus: *See*—
Theysohn, Rainer; Penzien, Klaus; Seydl, Wolfgang; Wurmb, Rolf; Reimann, Horst; Cordes, Claus; and Sterzel, Hans-Josef, 4,137,212, Cl. 260-37.00N.
Percarpio, Edward P., to Becton, Dickinson and Company. Cannula pierceable, self-sealing closure. 4,136,794, Cl. 215-247.000.
Perronnet, Jacques; Demoute, Jean-Pierre; Girault, Pierre; and Teche, Andre, to Roussel Uclaf. Novel ureas. 4,137,068, Cl. 71-98.000.
Perrot, Erwin, to Klauschenz & Perrot KG. Device for dialysation of blood. 4,137,168, Cl. 210-96.00M.
Perry, Gerald E., to Southeast Container Corporation; and White, Willis H. Variable-size carton blank. 4,136,817, Cl. 229-33.000.
Perry, Vernon L.; and Kelsey, Ronald D., to Applied Magnetics Corporation. Can sorting apparatus. 4,136,781, Cl. 209-552.000.
Peters, Klaus-Jurgen: *See*—
Knapp, Heinrich; Schwartz, Reinhardt; Schlott, Walter; Riel, Klaus; and Peters, Klaus-Jurgen, 4,136,653, Cl. 123-139.0AW.
Petersen, Thomas D., to Alvarado Orthopedic Research, Inc. Surgical knee holder. 4,136,858, Cl. 269-328.000.
Peterson, Marvin L., to Du Pont de Nemours, E. I., and Company. Hydroformylation process for preparation of predominantly linear aldehydes. 4,137,240, Cl. 260-340.700.
Pfeifer, Rolf, to Siemens Aktiengesellschaft. Program control apparatus for the photographic operating sequence of an x-ray photographic installation. 4,137,571, Cl. 365-49.000.
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Hangartner, Walter; and Pfiffner, Albert, 4,137,329, Cl. 424-342.000.
Pfister, Jean-Francois, to Societe Industrielle de Sonceboz S.A. Electrical drive device. 4,137,473, Cl. 310-98.000.
Pfizer Inc.: *See*—
Cox, David A.; Barnish, Ian T.; and Evans, Anthony G., 4,137,328, Cl. 424-324.000.
Leeming, Michael R. G.; and Stubbs, John K., 4,137,321, Cl. 424-270.000.
Ross, Barry C.; and Shroot, Braham, 4,137,312. Cl. 424-246.000.
Philip Morris Incorporated: *See*—
Miller, Douglas C., 4,136,503, Cl. 53-507.000.
Phillips, Earl G.: *See*—
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Phillips, Lawrence M.; and Porter, Homer O., to United States of America, Navy. Motion compensating liquid holding tank. 4,136,725, Cl. 150-0.500.
Phillips Petroleum Company: *See*—
Forseth, Glenn J., 4,136,975, Cl. 366-325.000.
Kinney, Alfred W., 4,136,720, Cl. 141-9.000.
Small, William M., 4,136,736, Cl. 165-162.000.
Smith, Richard L.; and Farrar, Ralph C., 4,137,391, Cl. 526-178.000.
Pierceall, Lewis. Fishing lure. 4,136,479, Cl. 43-42.220.
Pierson, Marvin B.: *See*—
Graff, Hart F.; Kohler, John B.; Parks, Noel W.; Pierson, Marvin B.; Schnedler, Paul E.; and Strait, Richard E., 4,137,347, Cl. 427-349.000.
Piet, Zenon; and Kramer, Daniel, to Kramer Trenton Co., by said Zenon Piet. Refrigerating systems with multiple evaporator fan and step control therefor. 4,137,057, Cl. 62-89.000.
Pietzka, Gerhard; and Tillmanns, Harald, to Sigri Elektrographit GmbH. Method for the manufacture of a coal-tar pitch coke. 4,137,150, Cl. 208-106.000.
Pietzsch, Ludwig; Kauer, Harald; and Hartmann, Rudolf, to Dr.-Ing. Ludwig Pietzsch. Rod connector for an endless track. 4,136,913, Cl. 305-58.0PC.
Pilipenko, Vitaly A.: *See*—
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Pilost, Daniel: *See*—
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Pinchin, James D.: *See*—
Abercrombie, James C.; Pinchin, James D.; and Van Loon, Jack J., 4,136,849, Cl. 249-18.000.
Pinchin, James Davis: *See*—
Abercrombie, James C.; Pinchin, James D.; and Van Loon, Jack J., 4,136,849, Cl. 249-18.000.
Piola, Aldo, to Dayton G.R.P. S.r.l. Apparatus for manufacturing poles of reinforced plastics material. 4,137,119, Cl. 156-431.000.
Piper, Ronald N., to Data Recording Instrument Company Limited. Paper guidance systems. 4,136,979, Cl. 400-616.200.
Pirck, Dietrich: *See*—
Fuchs, Gundolf; and Pirck, Dietrich, 4,137,207, Cl. 260-29.60T.
Piteau, Marc D.; and Senet, Jean-Pierre G., to Societe Nationale des Poudres et Explosifs. Preparation of chloroformates having terminal acrylic or methacrylic groups. 4,137,253, Cl. 260-463.000.

Pitney-Bowes, Inc.: *See—*
Dlugos, Daniel F., 4,137,568, Cl. 364-734.000.
Pitts, Robert W., Jr.: *See—*
Howard, Curtis E.; Calvin, Douglas G.; and Pitts, Robert W., Jr., 4,136,737, Cl. 166-251.000.
Pitzalis, Mario: *See—*
Lazzerini, Giorgio; Vargiu, Silvio; and Pitzalis, Mario, 4,137,220, Cl. 528-135.000.
Plan, Robert: *See—*
Makula, Marie-France; and Plan, Robert, 4,137,222, Cl. 260-112.00B.
Plantard, Dominique: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,137,059, Cl. 65-5.000.
Plantex, Ltd.: *See—*
Tedeschi, Enzo, 4,137,320, Cl. 424-270.000.
Platt Saco Lowell Limited: *See—*
Brooks, Frank E.; and Wunderlich, Guenther C., 4,136,835, Cl. 242-26.400.
Plessey Handel und Investments AG: *See—*
Pell, Christopher, 4,137,531, Cl. 343-6.50R.
Plessey Incorporated: *See—*
Frusco, John M., 4,137,546, Cl. 357-70.000.
Plog, Richard J., to Ansul Company, The. Sensor interface circuit. 4,137,467, Cl. 307-264.000.
Plummer, Derek, to Coal Industry (Patents) Limited. Excavating machines. 4,136,910, Cl. 299-31.000.
Poblano, Raul, to Instituto Mexicano del Petroleo. Setting retarding composition for well cementing and recementing. 4,137,093, Cl. 106-315.000.
Pogge, H. Bernhard: *See—*
Mader, Siegfried R.; Masters, Burton J.; and Pogge, H. Bernhard, 4,137,103, Cl. 148-33.000.
Pohl, Rudolph L., to Hercules Incorporated. Printing plates from polymer with terminal unsaturation. 4,137,081, Cl. 96-87.00R.
Poiget, Gilbert: *See—*
Farge, Daniel; Le Goff, Yves; and Poiget, Gilbert, 4,137,315, Cl. 424-248.560.
Poissant, Serge: *See—*
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Polaroid Corporation: *See—*
Cook, Gerald H.; and Holmes, William A., 4,136,935, Cl. 352-104.000.
McCune, William J., Jr., 4,137,194, Cl. 252-316.000.
Poncy, George W. Disposable thermometer sheath package. 4,136,776, Cl. 206-306.000.
Pont-a-Mousson S.A.: *See—*
Gaillot, Jean-Paul; and Kirch, Bernard P., 4,136,707, Cl. 137-75.000.
Poore, Wesley A.; Randolph, Edward F.; and Rockwell, Harvey W., to Fiat-Allis Construction Machinery, Inc. Power divider with governed speed control. 4,136,751, Cl. 180-70.00R.
Popkin, John R. Knockdown boat with inflatable hull. 4,136,414, Cl. 9-2.00A.
Porter, Homer O.: *See—*
Phillips, Lawrence M.; and Porter, Homer O., 4,136,725, Cl. 150-0.500.
Porter, Wilbur A.: *See—*
Kilby, Jack S.; Lathrop, Jay W.; and Porter, Wilbur A., 4,136,436, Cl. 29-572.000.
Porter, William H., to W. H. Porter, Inc. Insulating panel construction. 4,136,497, Cl. 52-593.000.
Posson, Chester A. Rotary engine. 4,136,661, Cl. 123-205.000.
Pott, Otto F., to G. Lufft Metallbarometerfabrik GmbH & Co. Method of and device for checking hygrometers and hygrostats. 4,136,550, Cl. 73-1.00G.
Potter, William D.; Barclay, Andrew C.; Dunning, Reginald; and Parry, Richard J., to Pilkington Brothers Limited. Glass compositions for use in curable compositions. 4,137,086, Cl. 106-52.000.
Potts, Vinson S., to Crown Cork & Seal Company, Inc. Easy-opening can end and method of opening. 4,136,797, Cl. 220-271.000.
Potzschke, Manfred: *See—*
Althoff, Jurgen; Jager, Kurt; Lommel, Heinz; Moller, Manfred; and Potzschke, Manfred, 4,137,102, Cl. 148-31.500.
Poulton & Son (Refractories) Limited: *See—*
Corbet, John S.; Basford, John; and Hemming, James R., 4,136,625, Cl. 431-336.000.
Powell Manufacturing Company, Inc.: *See—*
Wilson, Robert W., 4,136,465, Cl. 34-210.000.
Powlas, Jerome D.: *See—*
Vogel, Kenneth E.; and Powlas, Jerome D., 4,136,528, Cl. 62-174.000.
Pozniak, Norman J., to Dow Chemical Company, The. Pattern plate of composite structure. 4,136,615, Cl. 101-401.100.
PPG Industries, Inc.: *See—*
Blasko, John E.; Boberski, William G.; and Seiner, Jerome A., 4,137,087, Cl. 106-84.000.
DeTorre, Robert P., 4,136,807, Cl. 225-2.000.
Preh, Elektro-Feinmechanische Werke, Jakob Pre Nachf: *See—*
Then, Gebhard; and Spiller, Gerhard, 4,136,917, Cl. 339-17.00L.
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rold; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft; and Deutsche Gold- und Silber-Scheideanstalt Vormals Roessler. Process for the preparation of propylene oxide. 4,137,242, Cl. 260-348.250.
Prevorsek, Dusan C.; and Segal, Leon, to Allied Chemical Corporation. Thermoplastic benzophenone polyester. 4,137,218, Cl. 528-126.000.
Price, Stephen E.: *See—*
Gomm, Thiel; and Price, Stephen E., 4,136,930, Cl. 358-106.000.
Prichard, Mark S.; Hilton, Ashley S.; Stayer, Mark L., Jr.; and Antkowiak, Thomas A., to Firestone Tire & Rubber Company, The. Metal salt catalyzed polymerization of ($NPCl_2$) oligomers. 4,137,330, Cl. 423-300.000.
Prisland, Theodore: *See—*
Knobel, Gladys; and Prisland, Theodore, 4,136,784, Cl. 211-119.000.
Prochnow, Claus, to Rollei-Werke Franke & Heidecke. Photographic enlarger. 4,136,948, Cl. 355-71.000.
Procter & Gamble Company, The: *See—*
Van Duzee, Barry F., 4,137,309, Cl. 424-204.000.
Pronovost, Jacques O. Stirling type engine and method for operating same. 4,136,523, Cl. 60-517.000.
Proust, Francois: *See—*
Clin, Francois; Gony, Jean-Noel; and Proust, Francois, 4,137,155, Cl. 209-134.000.
Pryor, Harold A.: *See—*
Pryor, Roy R.; and Pryor, Harold A., 4,136,763, Cl. 193-35.00A.
Pryor, Roy R.; and Pryor, Harold A., 4,136,766, Cl. 198-485.000.
Pryor, Roy R.; and Pryor, Harold A. Sawmill stop assembly module. 4,136,763, Cl. 193-35.00A.
Pryor, Roy R.; and Pryor, Harold A. Sawmill pull-off assembly module. 4,136,766, Cl. 198-485.000.
Pullman Incorporated: *See—*
Schuller, James J.; Raksanyi, William; and Ferris, Ray L., 4,136,621, Cl. 105-308.00E.
Pulman, David A.: *See—*
Elliott, Michael; Janes, Norman F.; and Pulman, David A., 4,137,324, Cl. 424-282.000.
Pupak, Pupak T.: *See—*
Brozoski, Daniel J.; and Pupak, Pupak T., 4,137,490, Cl. 318-345.00G.
Putnam, Roger L., Jr.; Shultz, Richard H.; and O'Brien, Edward F., to Package Machinery Company. Tubeless vertical form, fill and seal packaging machine with improved feed means. 4,136,505, Cl. 53-551.000.
Putter, Rolf: *See—*
Werner, Friedrich; Putter, Rolf; and Wenzl, Peter, 4,137,238, Cl. 260-315.000.
QMA Inc.: *See—*
Mendoza, Gregory E.; Henthorn, Donald R.; and Taylor, James F., 4,136,521, Cl. 60-477.000.
Quick-Mount Manufacturing Company, Inc.: *See—*
Grashow, Joseph; and Krom, Jan H., 4,136,986, Cl. 403-197.000.
Quinn, Thomas H.: *See—*
Collins, James A.; and Quinn, Thomas H., 4,136,699, Cl. 128-290.00R.
Raasch, Hans, to W. Schlafhorst & Co. Method and device to determine defectively operating spinning stations. 4,136,511, Cl. 57-265.000.
Rabbits, Marc T.: *See—*
Glassman, Donald; and Rabbits, Marc T., 4,137,135, Cl. 203-87.000.
Rabinovich, Vyacheslav A.: *See—*
Nabiullin, Faat K.; Gertsik, Efim M.; Rabinovich, Vyacheslav A.; Soldatenko, Vladimir A.; and Rodionov, Jury T., 4,136,443, Cl. 29-731.000.
Racal-Amplivox Communications Ltd.: *See—*
Gorman, Anthony G., 4,136,688, Cl. 128-142.700.
Radlove, Sol B. Dietetic cookie mix. 4,137,336, Cl. 426-555.000.
Radway Plastics Limited: *See—*
Molyneux, George, 4,136,496, Cl. 52-302.000.
Rajchman, Jan A., to RCA Corporation. Cathode addressing system. 4,137,551, Cl. 358-230.000.
Rakouska, Kenneth D.: *See—*
Hetman, Frank W.; Rakouska, Kenneth D.; and Baron, Robert N., 4,136,419, Cl. 15-302.000.
Raksanyi, William: *See—*
Schuller, James J.; Raksanyi, William; and Ferris, Ray L., 4,136,621, Cl. 105-308.00E.
Rambach, Celestin, to C. van der Lely N.V. Soil cultivating implement. 4,136,741, Cl. 172-47.000.
Ramey, Carol, to Ramey, Carol, (a/k/a Carali Ramey). Cushioned vibrating means. 4,136,685, Cl. 128-33.000.
Ramey, Carol, (a/k/a Carali Ramey): *See—*
Ramey, Carol, 4,136,685, Cl. 128-33.000.
Ranco Incorporated: *See—*
Demaray, Merlin E.; and Attridge, Russell G., Jr., 4,136,732, Cl. 165-16.000.
Randolph, Edward F.: *See—*
Poore, Wesley A.; Randolph, Edward F.; and Rockwell, Harvey W., 4,136,751, Cl. 180-70.00R.
Ratti, Umberto: *See—*
Ferroglio, Luigino; and Ratti, Umberto, 4,137,425, Cl. 178-30.000.
Ray, Ranjan; Tanner, Lee E.; and Cline, Carl F., to Allied Chemical Corporation. Metallic glasses with a combination of high crystallization temperatures and high hardness values. 4,137,075, Cl. 75-174.000.
Raythoon Company: *See—*
Lowenschuss, Oscar, 4,137,497, Cl. 324-78.00F.
Razdymakha, Pavel S.: *See—*
Suslin, Vladimir I.; Makeev, Boris A.; Dubovik, Alexandr I.; Leksrev, Zinovy A.; Pilipenko, Vitaly A.; Etnaer, Alexandr I.; Kolesnichenko, Anatoly A.; and Razdymakha, Pavel S., 4,137,143, Cl. 204-224.00M.

RCA Corporation: *See—*
Becke, Hans W., 4,137,545, Cl. 357-39.000.
Credelle, Thomas L.; Hannan, William J.; and Spong, Fred W., 4,137,077, Cl. 96-1.100.
Credelle, Thomas L., 4,137,478, Cl. 313-422.000.
Kaganowicz, Grzegorz; Robinson, John W.; and Yasuda, Hirotsugu, 4,137,550, Cl. 358-128.000.
Kelly, William R.; and Barbin, Robert L., 4,137,548, Cl. 358-10.000.
Lin, Lawrence H., 4,136,940, Cl. 354-298.000.
Rajchman, Jan A., 4,137,551, Cl. 358-230.000.
Serafini, Joseph J., 4,137,552, Cl. 358-243.000.
van Raalte, John A., 4,137,485, Cl. 315-366.000.

Reba, Imants, to Crown Zellerbach Corporation. Web threading system. 4,136,808, Cl. 226-7.000.

Reclamet, Inc.: *See—*
Dudley, Robert H.; and Areaux, Larry D., 4,137,176, Cl. 210-375.000.

Redifer, William H. Floor sanding machine with controllable motion. 4,136,491, Cl. 51-177.000.

Redon, Georges, to Societe Anonyme dite: Alsthom-Unelec. Load limiter. 4,137,435, Cl. 200-85.00R.

Reece, John W.; Italiano, Victor J.; and Crump, Leslie L., to NCR Corporation. Matrix print wire solenoid. 4,137,513, Cl. 335-219.000.

Reece, Raymond D.: *See—*
Jenkins, Stuart M.; King, Albert K.; and Reece, Raymond D., 4,136,454, Cl. 33-147.00L.

Registrar, Jadavpur University: *See—*
Dutta, Sadhan K.; and Basu, Sanat K., 4,137,397, Cl. 536-9.000.

Reichelt, Ingo: *See—*
Schemmel, Hans R.; and Reichelt, Ingo, 4,137,466, Cl. 307-264.000.

Reichhold Chemicals Limited: *See—*
Batt, Colin B.; Kucharska, Helena Z.; and Jansen, Arie, 4,137,138, Cl. 204-159.180.

Reid, Robert E.; and Zang, Hyung K., to Texaco Inc. Catalytic hydrogenation process. 4,137,267, Cl. 260-583.00P.

Reifenhauser KG: *See—*
Reitemeyer, Paul; and Kupper, Franz J., 4,137,028, Cl. 425-141.000.

Reiff, Gunther: *See—*
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,137,219, Cl. 528-177.000.

Reimann, Horst: *See—*
Theysohn, Rainer; Penzien, Klaus; Seydl, Wolfgang; Wurmb, Rolf; Reimann, Horst; Cordes, Claus; and Sterzel, Hans-Josef, 4,137,212, Cl. 260-37.00N.

Reischl, Artur, to Bayer Aktiengesellschaft. Microporous sheets and a process for making them. 4,137,360, Cl. 428-310.000.

Reitel, Christian: *See—*
Koenig, Karl-Heinz; Reitel, Christian; and Mangold, Dietrich, 4,137,261, Cl. 260-544.00C.

Reitemeyer, Paul; and Kupper, Franz J., to Reifenhauser KG. Apparatus for the extrusion of tubular bodies of synthetic-resin material. 4,137,028, Cl. 425-141.000.

Reitz, R. Larry; Hutton, Thomas W.; and Lewis, Sheldon N., to Rohm and Haas Company. Hydrocurable compositions containing polyoxazoline groups. 4,137,385, Cl. 526-50.000.

Remaches Industriales S.A.: *See—*
Dahmen, David L.; and Zapata, Luis, 4,136,417, Cl. 10-27.00R.

Renal Systems, Inc.: *See—*
Cosentino, Louis C.; and Gallant, Stuart L., 4,136,708, Cl. 137-99.000.

Renckhoff, Gustav: *See—*
Hulsmann, Hans L.; and Renckhoff, Gustav, 4,137,399, Cl. 536-32.000.

Repa Feinstanzwerk GmbH: *See—*
Fohl, Artur, 4,136,841, Cl. 242-107.000.

Resnick, Bruce M.: *See—*
Brown, Michael J.; Resnick, Bruce M.; and Woodland, James H. R., 4,137,332, Cl. 424-326.000.

Retsky, Michael W.: *See—*
Torre, Alton J.; Retsky, Michael W.; Gioia, Norman F.; and Amin, Ramesh G., 4,137,480, Cl. 313-481.000.

Reuting, Hans-Werner, to Elmeg-Elektro-Mechanik Gesellschaft mit beschrankter Haftung. Socket assembly. 4,137,559, Cl. 361-331.000.

Rexnord Inc.: *See—*
Ghoshal, Ramkrishna, 4,136,774, Cl. 206-219.000.

Reynolds Metals Company: *See—*
Singleton, Ogle R., 4,137,073, Cl. 75-68.00R.

Reynolds, Reese M., to Motorola, Inc. Liquid crystal compounds and composition. 4,137,250, Cl. 260-455.00R.

Rhone-Poulenc Industries: *See—*
Farge, Daniel; Le Goff, Yves; and Poiget, Gilbert, 4,137,315, Cl. 424-248.560.

Ribka, Joachim: *See—*
Bauer, Wolfgang; and Ribka, Joachim, 4,137,228, Cl. 260-146.00R.

Ricci, Louis N.: *See—*
Maier, Alfred E.; and Ricci, Louis N., 4,137,437, Cl. 200-153.0SC.

Rice, Doris M.: *See—*
Edwards, Gayle D.; Rice, Doris M.; and Soulen, Robert L., 4,137,265, Cl. 260-570.900.

Ricoh Company, Ltd.: *See—*
Namiki, Ryoichi, 4,136,613, Cl. 118-60.000.
Ohta, Masafumi, 4,137,413, Cl. 544-348.000.

Riel, Klaus: *See—*
Knapp, Heinrich; Schwartz, Reinhardt; Schlott, Walter; Riel, Klaus; and Peters, Klaus-Jurgen, 4,136,653, Cl. 123-139.0AW.

Rife, Dwight A.: *See—*
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Rijsenbrij, Joannes C.: *See—*
Wormmeester, Gerhardus J.; and Rijsenbrij, Joannes C., 4,136,619, Cl. 104-244.100.

Rikon, Eli. Four hand checkerboard. 4,136,880, Cl. 273-261.000.

Ring Sights Limited: *See—*
Budden, Raymond G.; Scott, Fraser; and Dickinson, Ivan F. R., 4,136,963, Cl. 356-251.000.

Robbins, James A., to Signode Corporation. Dunnage bag end closure. 4,136,788, Cl. 214-10.50D.

Robert Bosch GmbH: *See—*
Heiser, Joachim, 4,136,600, Cl. 91-27.000.
Knapp, Heinrich; Schwartz, Reinhardt; Schlott, Walter; Riel, Klaus; and Peters, Klaus-Jurgen, 4,136,653, Cl. 123-139.0AW.
Kulke, Gunter; Kopse, Odon; and Schuster, Gregor, 4,136,654, Cl. 123-139.0AT.
Timmermann, Christian, 4,137,060, Cl. 65-31.000.

Robertshaw Controls Company: *See—*
Beaman, Norman V., 4,137,558, Cl. 361-284.000.

Robinson, John W.: *See—*
Kaganowicz, Grzegorz; Robinson, John W.; and Yasuda, Hirotsugu, 4,137,550, Cl. 358-128.000.

Robinson, Lynn M.: *See—*
Robinson, Merle W.; and Robinson, Lynn M., 4,136,579, Cl. 74-523.000.

Robinson, Merle W.; and Robinson, Lynn M. Force lever attachment for hand tools. 4,136,579, Cl. 74-523.000.

Robison, Allen M. Security locking box. 4,136,542, Cl. 70-290.000.

Rochat, Daniel, to Ebauches S.A. Electro-mechanic calendar timepiece. 4,136,514, Cl. 58-58.000.

Rock, John V., to Spectra-Physics, Inc. Flow control system for liquid chromatographs. 4,137,011, Cl. 417-22.000.

Rockwell, Harvey W.: *See—*
Poore, Wesley A.; Randolph, Edward F.; and Rockwell, Harvey W., 4,136,751, Cl. 180-70.00R.

Rockwell International Corporation: *See—*
Hooker, Marvin L., Jr., 4,137,530, Cl. 343-5.0VQ.

Rodder, Karl-Martin: *See—*
Hanisch, Horst; Rodder, Karl-Martin; and Hass, Hansjurgen, 4,137,091, Cl. 106-287.160.

Roder, Peter G. Aligned sliding jaw key set. 4,136,588, Cl. 81-165.000.

Rodionov, Jury T.: *See—*
Nabiullin, Faat K.; Gertsik, Efim M.; Rabinovich, Vyacheslav A.; Soldatenko, Vladimir A.; and Rodionov, Jury T., 4,136,443, Cl. 29-731.000.

Rodman, Michael R.; Holmes, Paul M.; and Habib, Joseph, to Aeroquip Corporation. Flareless tube fitting for 37° adapter. 4,136,896, Cl. 285-341.000.

Rodriguez Calderon, Eduardo: *See—*
Martinez Martinez, Eduardo G.; Azcarraga Maig, Guillermo; Soto Mendez, Emilio; Rodriguez Calderon, Eduardo; and Menendez Mesa, Nicanor, 4,136,679, Cl. 128-1.00R.

Rodriguez, Ludovic; Leclerca, Jacques; Ykman, Pierre; and Cossement, Eric, to U C B, Societe Anonyme. Amino-spiro[oxa(or thia)cycloalkane-penam]-carboxylic. 4,137,236, Cl. 260-306.70C.

Roe, Gerald. Apparatus for editing motion picture and sound film. 4,136,936, Cl. 352-129.000.

Roethler, Kenneth W. Tire lifting apparatus. 4,136,903, Cl. 294-81.00R.

Roger, Jack: *See—*
Arnould, Marcel; Struillou, Roger; and Roger, Jack, 4,137,089, Cl. 106-100.000.

Rogers Corporation: *See—*
Maron, Clarence G.; and Sundstrom, Donald W., 4,137,363, Cl. 428-338.000.

Rogers, Philip W.; and Parkin, Claude E., to Mammel, A. Dean. Flange valve having improved sealing characteristics and wear indicator. 4,136,709, Cl. 137-375.000.

Rohm and Haas Company: *See—*
Glavis, Frank L.; and Clemens, David H., 4,137,264, Cl. 260-567.60M.
Reitz, R. Larry; Hutton, Thomas W.; and Lewis, Sheldon N., 4,137,385, Cl. 526-50.000.

Rollei-Werke Franke & Heidecke: *See—*
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Rolls-Royce (1971) Limited: *See—*
Brandon, Robert J., Jr., 4,137,454, Cl. 250-402.000.

Romanov, Jury P.: *See—*
Varlamov, Vladimir M.; Sopin, Anatoly I.; Judaev, Vasily F.; Romanov, Jury P.; Kokarev, Dmitry T.; Metelyagin, Alexandr Z.; Shestakov, Vladislav A.; Fomin, Vladjmir I.; and Filin, Vladimir A., 4,136,971, Cl. 366-169.000.

Romanov, Nikolai T., deceased: *See—*
Gorodissky, Leonid G.; Vasilieva, Raisa V.; Kozlov, Mikhail D.; Romanov, Nikolai T., deceased; and Romanova, Anastasia I., administrator, 4,136,536, Cl. 68-5.00E.

Romanova, Anastasia I., administrator: *See—*
Gorodissky, Leonid G.; Vasilieva, Raisa V.; Kozlov, Mikhail D.; Romanov, Nikolai T., deceased; and Romanova, Anastasia I., administrator, 4,136,536, Cl. 68-5.00E.

Ronnholm, Arvi: *See—*
Suominen, Jorma; Candolin, Carl-Johan; and Ronnholm, Arvi, 4,137,134, Cl. 203-73.000.

Rosai, Livio: *See—*
della Porta, Paolo; Ferrario, Bruno; and Rosai, Livio, 4,137,012, Cl. 417-51.000.

Rosenblum, Frank, to Noranda Mines Limited. Pulp density meter. 4,136,567, Cl. 73-438.000.

Rosene, Will A.: *See—*
Mayes, James T., Jr.; and Rosene, Will A., 4,137,354, Cl. 428-116.000.

Rosenfeld, Jerold C.: *See—*
Lemper, Anthony L.; and Rosenfeld, Jerold C., 4,137,278, Cl. 260-860.000.

Rosinbaum, Jacky R.; and Rosinbaum, Terry L. Log dispenser for fireplace. 4,136,762, Cl. 193-34.000.

Rosinbaum, Terry L.: *See—*
Rosinbaum, Jacky R.; and Rosinbaum, Terry L., 4,136,762, Cl. 193-34.000.

Ross, Barry C.; and Shroot, Braham, to Pfizer Inc. Epoxy substituted cephalosporin derivatives. 4,137,312, Cl. 424-246.000.

Ross, Milton D.: *See—*
Brandewie, Joseph E.; Folk, Kenneth F.; and Ross, Milton D., 4,136,440, Cl. 29-628.000.

Roth, Charles A.: *See—*
Holbrook, George W.; Jakubczak, Eugene R.; and Roth, Charles A., 4,137,189, Cl. 252-75.000.

Rothgordt, Ulf: *See—*
Hinz, Hans-Dieter; and Rothgordt, Ulf, 4,137,536, Cl. 346-155.000.

Roussel Uclaf: *See—*
Perronnet, Jacques; Demoute, Jean-Pierre; Girault, Pierre; and Teche, Andre, 4,137,068, Cl. 71-98.000.

Rowsell, David G.; and Hems, Roger, to Wilkinson Sword Limited. Cyclic substituted ureas having a physiological cooling effect. 4,137,304, Cl. 424-54.000.

Rowsell, David G.; and Hems, Roger, to Wilkinson Sword Limited. Cyclic amides having a physiological cooling effect. 4,137,305, Cl. 424-54.000.

Rubber Millers, Inc.: *See—*
Day, John T.; Herder, Robert O.; Blockwick, Thomas N.; Brockman, Dan B.; Sharpe, John F.; and Hildebrand, Richard W., 4,136,632, Cl. 114-220.000.

Rubin, Sol R.; and Gates, Raymond D., to Masco Corporation. Pilot operated ball cock valve. 4,136,711, Cl. 137-414.000.

Rubino, Andrew M.; and Margres, John J., to Armour Pharmaceutical Company. Anhydrous antiperspirant stick compositions. 4,137,306, Cl. 424-68.000.

Ruchlak, Kasimir: *See—*
Kraus, Helmut; Muller, Heinz; Huber, Hans; and Ruchlak, Kasimir, 4,137,381, Cl. 526-3.000.

Rudolph, Hans: *See—*
Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,137,219, Cl. 528-177.000.

Rudy, Samuel: *See—*
Morey, Booker W.; and Rudy, Samuel, 4,137,156, Cl. 209-212.000.

Ruger, Wolfgand, to Schmidt, Karl-Heinz. Extruderhead. 4,137,027, Cl. 425-133.500.

Ruhl, Henry: *See—*
Crute, Billy G.; Ruhl, Henry; and Coffey, William R., 4,136,795, Cl. 220-203.000.

Ruhnau, Gerhard: *See—*
Hesse, Karl-Heinz; Ruhnau, Gerhard; Gudat, Wolfgang; and Liermann, Peter, 4,136,912, Cl. 303-91.000.

Ruhrkohle AG: *See—*
Bassier, Friedrich-Karl; and Goldschmidt, Klaus, 4,136,998, Cl. 405-267.000.

Rupprecht, Walter. Telescoping antenna mast. 4,137,535, Cl. 343-902.000.

S.A.E.S. Getters S.p.A.: *See—*
della Porta, Paolo; Ferrario, Bruno; and Rosai, Livio, 4,137,012, Cl. 417-51.000.

S.B.W. Engineers Limited: *See—*
Workman, John, 4,137,472, Cl. 310-61.000.

SAB Industri AB: *See—*
Sander, Nils B. L., 4,136,760, Cl. 188-198.000.

Sabol, Albert R., to Standard Oil Company (Indiana). Process for the manufacture of overbased magnesium sulfonates. 4,137,186, Cl. 252-33.000.

Sabourin, Edward T.: *See—*
Schulz, Johann G. D.; and Sabourin, Edward T., 4,137,418, Cl. 562-407.000.

Sachs, Carrol C. Polymer-inorganic foam. 4,137,198, Cl. 521-154.000.

Saeki, Tatsushi: *See—*
Miyake, Tetsuya; Takeda, Kunihiko; Miyata, Naoki; Saeki, Tatsushi; and Seko, Maomi, 4,137,054, Cl. 55-33.000.

Safonov, Viktor K.: *See—*
Sokolov, Sergei S.; Safonov, Viktor K.; and Vlasov, Leonid I., 4,136,656, Cl. 123-140.0FG.

Saft-Societe des Accumulateurs Fixes et de Traction: *See—*
Coueille, Daniel, 4,137,375, Cl. 429-66.000.

Sagady, Daniel V., to General Motors Corporation. Centered fastener assembly. 4,136,982, Cl. 403-108.000.

Sagami Chemical Research Center: *See—*
Tsuchihashi, Genichi; Ogura, Katsuyuki; Yaso, Masao; Kuramoto, Masashi; Fujii, Tadashiro; and Watanabe, Tetsuo, 4,137,406, Cl. 544-27.000.

Sagane, Norio; Kohara, Minoru; Shiohara, Tomoo; and Araki, Yasuhiko, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Process for stabilizing chlorine-containing resins. 4,137,383, Cl. 526-24.000.

Sageman, David R.: *See—*
Mitchell, David S.; and Sageman, David R., 4,137,053, Cl. 48-197.00R.

Saint-Gobain Industries: *See—*
Levecque, Marcel; Battigelli, Jean A.; and Plantard, Dominique, 4,137,059, Cl. 65-5.000.

Saito, Muneo: *See—*
Tokitsu, Naoki; and Saito, Muneo, 4,137,553, Cl. 360-6.000.

Saito, Yasuhiro: *See—*
Doi, Yoshihiko; Saito, Yasuhiro; Kobayashi, Mitsunori; and Hiraoka, Seiki, 4,137,106, Cl. 148-126.000.

Sakaki, Yoshihiro, to Nissan Motor Company, Limited. Heat accumulating member for a rotary heat-accumulation type heat exchanger of a gas turbine engine. 4,136,729, Cl. 165-9.000.

Sakakibara, Takao; and Okazaki, Haruhiko, to Dai Nippon Toryo Co., Ltd. Process for forming multi-layer coatings. 4,137,349, Cl. 427-380.000.

Sakamoto, Hideo: *See—*
Satomi, Takeo; Hino, Naganori; Hirano, Masachika; Mukai, Kunio; Sakamoto, Hideo; and Yoshida, Ryo, 4,137,065, Cl. 71-87.000.

Sako, Fumio F.; and Pearson, Christopher C., to FMC Corporation. Rotating biological contactor. 4,137,172, Cl. 210-150.000.

Sakurai, Akira; and Fujita, Manabu, to Kao Soap Co., Ltd. Gelatinous fragrance-imparting composition containing stabilized perfume. 4,137,196, Cl. 252-522.000.

Salathiel, William M.; and Shaughnessy, Christopher M., to Exxon Production Research Company. Method for generating hydrofluoric acid in a subterranean formation. 4,136,739, Cl. 166-300.000.

Salyer, Ival O.: *See—*
Ball, George L., III; Werkmeister, Dennis W.; and Salyer, Ival O., 4,137,364, Cl. 428-412.000.

Sama, Nicholas. No tie down valve. 4,136,601, Cl. 91-424.000.

Samonov, Valentin T. Spindle for a machine for sealing electric vacuum devices. 4,136,426, Cl. 29-25.190.

Sample, Thomas E., Jr.; and Horn, John M., to Dresser Industries, Inc. Silane coated silicate minerals and method for preparing same. 4,137,367, Cl. 428-443.000.

Sampson, George B.: *See—*
Bowie, William R., Jr.; and Sampson, George B., 4,136,888, Cl. 280-5.220.

Sander, Nils B. L., to SAB Industri AB. Clasp brake rigging for a railway vehicle. 4,136,760, Cl. 188-198.000.

Sanders, Gerald W.: *See—*
Groos, Richard T.; and Sanders, Gerald W., 4,136,740, Cl. 169-39.000.

Sanderson, Gerald D.: *See—*
Yateman, Earl W.; and Sanderson, Gerald D., 4,136,768, Cl. 198-830.000.

Sandoz Ltd.: *See—*
Bastian, Jean-Michel, 4,137,323, Cl. 424-275.000.
Berthold, Richard; and Troxler, Franz, 4,137,331, Cl. 424-267.000.
Trueb, Werner, 4,137,064, Cl. 71-86.000.

Sandvik Aktiebolag: *See—*
Claesson, Tore V.; and Gustavsson, Gustav R. A., 4,136,918, Cl. 339-31.00R.

Sankin Kogyo, Ltd.: *See—*
Yogosawa, Fumio, 4,137,443, Cl. 219-86.210.

Sankyo Company Limited: *See—*
Endo, Akira; Terahara, Akira; Kitano, Noritoshi; Ogiso, Akira; and Mitsui, Seiji, 4,137,322, Cl. 424-273.00R.

Sanson, Joseph F., to Upjohn Company, The. Apparatus for the manufacture of cushions. 4,137,030, Cl. 425-388.000.

Santen Pharmaceutical Co., Ltd.: *See—*
Fujita, Tadashi; Oya, Masayuki; Takashina, Hideo; and Iso, Tadashi, 4,137,420, Cl. 562-426.000.

Sardee Corporation, The: *See—*
Sarovich, Steve, 4,136,767, Cl. 198-689.000.

Sardisco, John B., to Pennzoil Company. Production of potassium polyphosphates from potassium silicofluorides. 4,137,063, Cl. 71-51.000.

Sarkar, Arnab: *See—*
Huang, Yung-Yien; Olszewski, Jerzy A.; and Sarkar, Arnab, 4,136,960, Cl. 356-239.000.

Sarli, Michael S.: *See—*
Gillespie, Bernard M.; Sarli, Michael S.; and Smith, Kenneth W., 4,137,148, Cl. 208-87.000.

Sarovich, Steve, to Sardee Corporation, The. Vacuum operated can-conveying and can-uprighting apparatus. 4,136,767, Cl. 198-689.000.

Sarracino, Mario; and Lannaioli, Arduino, to Italsider S.p.A. Method for improving the resistance to embrittlement due to hydrogen in welded joints. 4,136,814, Cl. 228-263.000.

Sasaki, Takuya; Yamane, Tamotsu; Horibe, Yoshun; and Suzuki, Mituo, to Hitachi, Ltd. Feedwater heater. 4,136,734, Cl. 165-111.000.

Sato, Hidetoshi; and Ohkita, Masao, to Alps Electric Co., Ltd. Lever switch. 4,137,438, Cl. 200-153.00H.

Sato, Keiji: *See—*
Uetake, Shigeru; Tozawa, Katsutoshi; and Sato, Keiji, 4,137,188, Cl. 252-62.10P.

Sato, Kuniaki, to Kajima Corporation. H-shaped steel column base member and welding thereof. 4,136,811, Cl. 228-165.000.

Sato, Masaki; Watanabe, Mashatoshi; Takahashi, Noriyoshi; and Takahashi, Miyoshi, to Hitachi, Ltd. Stator winding structure for gap winding type electric rotary machine. 4,137,471, Cl. 310-51.000.

Sato, Takeshi: *See—*
Nagata, Koichi; Miyazawa, Kokichi; Sato, Takeshi; Tsuchimoto, Masashi; and Kawashima, Junichi, 4,137,293, Cl. 423-140.000.

Satomi, Takeo; Hino, Naganori; Hirano, Masachika; Mukai, Kunio; Sakamoto, Hideo; and Yoshida, Ryo, to Sumitomo Chemical Company, Ltd. Amido phosphorothiolate pesticide. 4,137,065, Cl. 71-87.000.

Sawaoka, Eiji, to Tokyo Shibaura Electric Co., Ltd. Electrophotographic copying machine. 4,136,941, Cl. 355-3.00R.

Sawyer, Harold T., to Beehler, Vernon D., a part interest. Apparatus and method for deliquifying material. 4,137,159, Cl. 210-19.000.

Scales, John T., to Institute of Orthopaedics, The. Support appliance. 4,136,413, Cl. 5-365.000.

Scaletta, Joseph A.: *See*—
Miller, Roland E.; Scaletta, Joseph A.; and Valek, John, 4,136,627, Cl. 113-18.00A.

Scattergood, Mark G.; and Howson, David C. Linear electromyographic biofeedback system. 4,136,684, Cl. 128-2.10M.

Schalch, Fred, to Fael S.A. Wire resistance-roll welder with brake and tension devices. 4,137,444, Cl. 219-81.000.

Scharfenbergkupplung GmbH: *See*—
Forster, Hilmar; and Gunther, Wilhelm, 4,136,787, Cl. 213-40.00R.

Scheffel, Herbert; and von Gericke, Rowlen E., to South African Inventions Development Corporation. Self steering railway truck. 4,136,620, Cl. 105-168.000.

Scheffer, Terry J.: *See*—
Osman, Maged A.; and Scheffer, Terry J., 4,137,193, Cl. 252-299.000.

Scheier, Donald J.; and Frederick, Henry E., to Gordon Johnson Company. Method and apparatus for opening the body cavity of poultry. 4,136,421, Cl. 17-52.000.

Schemmel, Hans R.; and Reichelt, Ingo, to U.S. Philips Corporation. Controllable electronic resistance device. 4,137,466, Cl. 307-264.000.

Schering Corporation: *See*—
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., 4,137,224, Cl. 260-112.50R.

Schirneker, Hans-Ludwig. Cartridge for hand and shoulder firearms. 4,136,616, Cl. 102-38.00R.

Schlom, Leslie A.; Dubey, Michael B.; and Becwar, Andrew J. Precooler. 4,137,058, Cl. 62-121.000.

Schlott, Walter: *See*—
Knapp, Heinrich; Schwartz, Reinhardt; Schlott, Walter; Riel, Klaus; and Peters, Klaus-Jurgen, 4,136,653, Cl. 123-139.0AW.

Schmid, Markus, to Concast AG. Continuous steel casting mold for billets and blooms. 4,136,728, Cl. 164-444.000.

Schmidt, Hugo, to Feldmuhle Aktiengesellschaft. Method and apparatus for separating individual blanks of a multiple cardboard blank. 4,136,604, Cl. 93-36.00A.

Schmidt, Karl-Heinz: *See*—
Ruger, Wolfgand, 4,137,027, Cl. 425-133.500.

Schmidt, Klaus; Hoffmann, Harald; and Fahrback, Erich, to Carl Freudenberg, Firma. Storage battery with separator of dumbbell-shaped fibers. 4,137,379, Cl. 429-254.000.

Schmitt, Hermann: *See*—
Heimberger, Werner; and Schmitt, Hermann, 4,137,166, Cl. 210-62.000.

Schnedler, Paul E.: *See*—
Graff, Hart F.; Kohler, John B.; Parks, Noel W.; Pierson, Marvin B.; Schnedler, Paul E.; and Strait, Richard E., 4,137,347, Cl. 427-349.000.

Schoch, Robert, to Weinmann GmbH & Co. KG. Bicycle rim brake. 4,13o,759, Cl. 188-24.000.

Scholtholt, Hans; and Steiner, Ewald, to Siemens Aktiengesellschaft. Wire clamping element. 4,136,920, Cl. 339-98.000.

Schonball, Walter. Rotor blade structure. 4,137,007, Cl. 416-229.00R.

Schreyer, Gerd: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rold; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,137,242, Cl. 260-348.250.

Schubert & Salzer: *See*—
Husges, Gerd; and Karl, Rupert, 4,136,911, Cl. 302-59.000.
Niestroj, Heinrich; and Denz, Peter, 4,137,487, Cl. 318-39.000.

Schuller, James J.; Raksanyi, William; and Ferris, Ray L., to Pullman Incorporated. Railway hopper car door locking mechanism. 4,136,621, Cl. 105-308.00E.

Schultz, Forrest O. E., to Midland-Ross Corporation. Stored energy module. 4,137,492, Cl. 320-1.000.

Schultz, Hans-Joachim: *See*—
Bubik, Alfred; and Schultz, Hans-Joachim, 4,137,124, Cl. 162-343.000.

Schulz, Johann G. D.; and Sabourin, Edward T., to Gulf Research & Development Company. Conversion of carbonaceous material. 4,137,418, Cl. 562-407.000.

Schulz, Johann G. D.: *See*—
Bacha, John D.; Onopchenko, Anatoli; and Schulz, Johann G. D., 4,137,419, Cl. 562-408.000.

Schuster, Gregor: *See*—
Kulke, Gunter; Kopse, Odon; and Schuster, Gregor, 4,136,654, Cl. 123-139.0AT.

Schwab, Gerhart: *See*—
Davis, Gerald T.; Schwab, Gerhart; and Shackle, Dale R., 4,137,343, Cl. 427-150.000.

Schwartz, Albert B.: *See*—
Chester, Arthur W.; Schwartz, Albert B.; and Stover, William A., 4,137,152, Cl. 208-120.000.

Schwartz, James W., to Zenith Radio Corporation. Electron beam cathodoluminescent panel display. 4,137,486, Cl. 315-366.000.

Schwartz, Paul: *See*—
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Schwartz, Reinhardt: *See*—
Knapp, Heinrich; Schwartz, Reinhardt; Schlott, Walter; Riel, Klaus; and Peters, Klaus-Jurgen, 4,136,653, Cl. 123-139.0AW.

Schwarz, Hans-Helmut: *See*—
Immel, Otto; Kaiser, Bernd-Ulrich; Schwarz, Hans-Helmut; and Starke, Klaus, 4,137,263, Cl. 260-566.00A.

Schwerdtel, Wulf: *See*—
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SCM Corporation: *See*—
Gawrilow, Ilija, 4,137,338, Cl. 426-601.000.
Traynor, Sean G., 4,137,257, Cl. 260-503.000.

Scobey, Fred J.: *See*—
Degenkolb, David J.; and Scobey, Fred J., 4,137,290, Cl. 423-1.000.

Scott, Charles E.; and Small, James E., to P.R. Mallory & Co. Inc. Control system utilizing momentary switching devices. 4,137,463, Cl. 307-141.000.

Scott, Fraser: *See*—
Budden, Raymond G.; Scott, Fraser; and Dickinson, Ivan F. R., 4,136,963, Cl. 356-251.000.

Scott, Hubert D.: *See*—
Paap, Hans J.; Arnold, Dan M.; and Scott, Hubert D., 4,137,452, Cl. 250-270.000.

Scott, Julian P.: *See*—
King, Hewson N. G.; and Scott, Julian P., 4,137,458, Cl. 250-492.00A.

Seattle Box Co.: *See*—
Nist, Eugene M., 4,136,988, Cl. 403-231.000.

See-Pak Corporation: *See*—
Shore, William S., 4,136,502, Cl. 53-493.000.

Seeger, Ernst: *See*—
Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; Haarmann, Walter; and Engelhardt, Gunther, 4,137,313, Cl. 424-246.000.

Segal, Leon: *See*—
Prevorsek, Dusan C.; and Segal, Leon, 4,137,218, Cl. 528-126.000.

Seglin, Leonard: *See*—
Slattery, Gerald H.; and Seglin, Leonard, 4,137,256, Cl. 260-502.00A.

Seifert, Hermann: *See*—
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Seifert, Horst: *See*—
Krol, Johannes W. A.; Lersmacher, Bernhard; Lydtin, Hans; and Seifert, Horst, 4,137,477, Cl. 313-348.000.

Seiner, Jerome A.: *See*—
Blasko, John E.; Boberski, William G.; and Seiner, Jerome A., 4,137,087, Cl. 106-84.000.

Seki, Kohji: *See*—
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Sekisui Kagaku Kogyo Kabushiki Kaisha: *See*—
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Seko, Maomi: *See*—
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Selander, Stig: *See*—
Cederquist, Karl; Marechal, Bernard; and Selander, Stig, 4,136,831, Cl. 241-18.000.

Sellstedt, John H.; Guinosso, Charles J.; Shriver, David A.; and Klaubert, Dieter H., to American Home Products Corporation. Antisecretory oxamic acid esters. 4,137,325, Cl. 424-311.000.

Seltzer, Raymond; and DiPrima, Joseph F., to Ciba-Geigy Corporation. Radiation curable hydantoin diacrylate compounds. 4,137,139, Cl. 204-159.230.

Senet, Jean-Pierre G.: *See*—
Piteau, Marc D.; and Senet, Jean-Pierre G., 4,137,253, Cl. 260-463.000.

Sera, Hidefumi; Ishii, Tsumoru; Yamaguchi, June; and Shiraishi, Hisashi, to Fuji Photo Film Co., Ltd. Photographic light-sensitive material hardened with a vinylsulfonyl compound. 4,137,082, Cl. 96-111.000.

Serafini, Joseph J., to RCA Corporation. Automatic beam current limiter with independently determined threshold level and dynamic control range. 4,137,552, Cl. 358-243.000.

Seredenko, Vladimir P.: *See*—
Mushenko, Nikolai Y.; KLarin, Gennady P.; Seredenko, Vladimir P.; and Svetikov, Ivan P., 4,136,827, Cl. 239-419.300.

Seron Manufacturing Company: *See*—
Seron, Suren V., 4,136,934, Cl. 351-157.000.

Seron, Suren V., to Seron Manufacturing Company. Eyeglass holder. 4,136,934, Cl. 351-157.000.

Sessa, Conio, to Alpex Computer Corporation. Protection circuit for a data transmission system. 4,137,556, Cl. 361-91.000.

Severijns, Adrianus P.: *See*—
Staas, Frans A.; and Severijns, Adrianus P., 4,136,531, Cl. 62-502.000.

Seydl, Wolfgang: *See*—
Theysohn, Rainer; Penzien, Klaus; Seydl, Wolfgang; Wurmb, Rolf; Reimann, Horst; Cordes, Claus; and Sterzel, Hans-Josef, 4,137,212, Cl. 260-37.00N.

Seymour, Herbert R., to Grumman Aerospace Corporation. Electro-optic space positioner. 4,136,568, Cl. 73-655.000.

Shackelford, Judy; and Terzian, Rouben T., to Marvin Glass & Associates. Doll with changeable facial features. 4,136,483, Cl. 46-135.00R.

Shackle, Dale R.: *See*—
Davis, Gerald T.; and Shackle, Dale R., 4,137,084, Cl. 106-21.000.
Davis, Gerald T.; Schwab, Gerhart; and Shackle, Dale R., 4,137,343, Cl. 427-150.000.
Shacklett, James H., Jr.; and Bittner, Charles W., to Shacklett, James H., Jr. Method and apparatus for manufacture of rolled information label. 4,136,860, Cl. 270-61.00R.
Shamlian, Ralph B., to Farallon Industries, Inc. Customized mouthpiece retainer for an underwater breathing apparatus. 4,136,689, Cl. 128-147.000.
Shamp, Donald E.: *See*—
Daman, Lloyd W.; Marti, Don V., II; Newsom, Michael L.; and Shamp, Donald E., 4,137,037, Cl. 432-3.000.
Shanbrom, Edward; and Bishop, Robert C., to Edward Shanbrom, Inc. Method of preserving blood plasma II. 4,137,223, Cl. 260-112.00B.
Shapiro, Jonathan S.: *See*—
Fitzsimmons, Thomas W.; Berluti, Vincent, Jr.; Wagner, Howard G.; and Shapiro, Jonathan S., 4,137,460, Cl. 250-511.000.
Sharp Kabushiki Kaisha: *See*—
Tateda, Koichi, 4,137,442, Cl. 219-10.55B.
Sharpe, John F.: *See*—
Day, John T.; Herder, Robert O.; Blockwick, Thomas N.; Brockman, Dan B.; Sharpe, John F.; and Hildebrand, Richard W., 4,136,632, Cl. 114-220.000.
Shaughnessy, Christopher M.: *See*—
Salathiel, William M.; and Shaughnessy, Christopher M., 4,136,739, Cl. 166-300.000.
Shaw, Milton C.; Komanduri, Rangachary; and Kumekawa, Soichi, to Carnegie-Mellon University. Grinding wheel crack detector. 4,137,516, Cl. 338-67.000.
Shelepov, Nikolai S.: *See*—
Barbashin, Oleg A.; Okunev, Alexandr A.; Mikhailov, Sergei K.; Mochalov, Lev E.; Orlov, Lev P.; Shenderov, Lev B.; Shelepov, Nikolai S.; Dubodin, Vissarion M.; Vladimirov, Alexandr S.; and Gorynin, Igor V., 4,137,422, Cl. 13-9.00R.
Shelly, Edward A.: *See*—
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Shenderov, Lev B.: *See*—
Barbashin, Oleg A.; Okunev, Alexandr A.; Mikhailov, Sergei K.; Mochalov, Lev E.; Orlov, Lev P.; Shenderov, Lev B.; Shelepov, Nikolai S.; Dubodin, Vissarion M.; Vladimirov, Alexandr S.; and Gorynin, Igor V., 4,137,422, Cl. 13-9.00R.
Sherif, Fawzy G.; and Irani, Mazin R., to Stauffer Chemical Company. Phosphorus-nitrogen-silica composition as a flame retardant. 4,137,178, Cl. 252-8.100.
Shestakov, Vladislav A.: *See*—
Varlamov, Vladimir M.; Sopin, Anatoly I.; Judaev, Vasily F.; Romanov, Jury P.; Kokarev, Dmitry T.; Metelyagin, Alexandr Z.; Shestakov, Vladislav A.; Fomin, Vladimir I.; and Filin, Vladimir A., 4,136,971, Cl. 366-169.000.
Sheth, Pravin; and Leeson, Lewis J., to Ciba-Geigy Corporation. Sustained action dosage forms. 4,137,300, Cl. 424-21.000.
Shibano, Takashi: *See*—
Akao, Masatake; Yokose, Yoshikazu; Yamashita, Kazuo; and Shibano, Takashi, 4,137,515, Cl. 336-84.00C.
Shikin, Vladimir G.: *See*—
Ivanov, Jury N.; Suris, Leonid I.; Zaitsev, Nikolai M.; and Shikin, Vladimir G., 4,136,422, Cl. 24-170.000.
Shimada, Mitsuo; and Fujii, Yoshio, to Hitachi, Ltd. Liquid chromatograph apparatus. 4,137,161, Cl. 210-31.00C.
Shimizu, Masaaki. Bookbinding machine. 4,137,120, Cl. 156-556.000.
Shiohara, Tomoo: *See*—
Sagane, Norio; Kohara, Minoru; Shiohara, Tomoo; and Araki, Yasuhiko, 4,137,383, Cl. 526-24.000.
Shiozaki, Makoto: *See*—
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,136,645, Cl. 123-32.0EE.
Shiraishi, Hisashi: *See*—
Sera, Hidefumi; Ishii, Tsumoru; Yamaguchi, June; and Shiraishi, Hisashi, 4,137,082, Cl. 96-111.000.
Shlatz, Myron F.: *See*—
Kunz, Barton H.; Shlatz, Myron F.; and Simson, Lowell M., 4,136,862, Cl. 271-186.000.
Shoda, Yoshikazu, to Nishihara Environmental Sanitation Research Corporation Limited, a part interest. Filtering apparatus for sludgy liquids. 4,137,177, Cl. 210-403.000.
Shoemaker, Charles T.; and Engler, Joseph P., to Hoffmaster Company, Inc., The. Non-skid place mat and the like. 4,137,356, Cl. 428-211.000.
Shoemaker, Paul D.: *See*—
Sidebotham, Norman C.; Shoemaker, Paul D.; and Young, Clarence W., III, 4,137,393, Cl. 528-491.000.
Shore, William S., to See-Pak Corporation. Inflater sealer machine. 4,136,502, Cl. 53-493.000.
Short, Wilbur G., to Canron, Inc. Front operated rake adjustment assembly. 4,136,593, Cl. 83-624.000.
Showa Electric Wire & Cable Co., Ltd.: *See*—
Masahiko, Yamada, 4,136,544, Cl. 72-201.000.
Shriver, David A.: *See*—
Sellstedt, John H.; Guinosso, Charles J.; Shriver, David A.; and Klaubert, Dieter H., 4,137,325, Cl. 424-311.000.
Shroot, Braham: *See*—
Ross, Barry C.; and Shroot, Braham, 4,137,312, Cl. 424-246.000.
Shultz, Richard H.: *See*—
Putnam, Roger L., Jr.; Shultz, Richard H.; and O'Brien, Edward F., 4,136,505, Cl. 53-551.000.
Shum, Ming S., to UOP Inc. Method for producing improved heat transfer surface. 4,136,427, Cl. 29-157.400.
Shver, Valery G.: *See*—
Khokhulin, Vladimir N.; Grachev, Andrei N.; Shver, Valery G.; and Kozlov, Valentin L., 4,136,487, Cl. 51-33.00R.
Sibalis, Dan. Modified induction motor for use in a three phase power system. 4,137,488, Cl. 318-778.000.
Sico Incorporated: *See*—
Bue, Richard C.; and Carlson, Casey L., 4,136,622, Cl. 108-48.000.
Siddall, John B., to Zoecon Corporation. Phenolic ethers. 4,137,273, Cl. 568-648.000.
Sidebotham, Norman C.; Shoemaker, Paul D.; and Young, Clarence W., III, to Monsanto Company. Polyester polymer recovery from dyed polyester fibers. 4,137,393, Cl. 528-491.000.
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Auracher, Franz; and Kersten, Ralf, 4,136,439, Cl. 29-624.000.
Engelmann, Gottfried; and Christoph, Guenter, 4,136,809, Cl. 226-79.000.
Guenther, Werner; Stueber, Franz; Muether, Manfred; and Kratochwilla, Hans-Michael, 4,136,450, Cl. 32-22.000.
Krimmel, Eberhard, 4,137,457, Cl. 250-492.00A.
Krueger, Hans; and Welsch, Wolfgang, 4,136,932, Cl. 350-335.000.
Pfeifer, Rolf, 4,137,571, Cl. 365-49.000.
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Signode Corporation: *See*—
Robbins, James A., 4,136,788, Cl. 214-10.50D.
Sigri Elektrographit GmbH: *See*—
Pietzka, Gerhard; and Tillmanns, Harald, 4,137,150, Cl. 208-106.000.
Silmet Ltd.: *See*—
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Simmons, Elmer C., to Digital Equipment Corporation. Digital filter. 4,137,504, Cl. 328-165.000.
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Sunnergren, Carl E.; Simms, John K.; and Brinker, Dale W., 4,136,965, Cl. 366-25.000.
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Singh, Tej K., to Associated Paper Industries Limited. Method of making laminated insoles. 4,137,110, Cl. 156-62.200.
Singleton, Ogle R., to Reynolds Metals Company. Method and apparatus for treating aluminous metal skim material and by-products of said method. 4,137,073, Cl. 75-68.00R.
Sirota, Julius, to National Starch and Chemical Corporation. Flexible film laminating adhesives. 4,137,276, Cl. 260-830.00P.
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Bell, Cecil R., Jr.; and Sizemore, Walter R., 4,136,557, Cl. 73-816.000.
Sjoholm, Claes B.; and Martensson, Karl J. G., to Alfa-Laval AB. Arrangement for cleaning a sealing ring on a shaft. 4,136,886, Cl. 277-24.000.
Skaadel, Johannes; and Omdal, Bjarne, to Norsk Hydro A.S. Flexible container for transportation and storage of bulk material. 4,136,723, Cl. 150-1.000.
Skagit Corporation: *See*—
Morrow, Gary R.; and Dargitz, Larry L., 4,136,786, Cl. 212-76.000.
SKF Nova AB: *See*—
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Hoyer, Norman S.; Slade, Paul G.; and Kossowsky, Ram, 4,137,076, Cl. 75-241.000.
Slattery, Gerald H.; and Seglin, Leonard, to FMC Corporation. Preparation of peracetic acid by oxidation of acetaldehyde. 4,137,256, Cl. 260-502.00A.
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Sloan, Donald A.; and King, James F., to Hanes Corporation. System for stacking flexible or semi-rigid articles. 4,136,863, Cl. 271-212.000.
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Scott, Charles E.; and Small, James E., 4,137,463, Cl. 307-141.000.
Small, William M., to Phillips Petroleum Company. Baffle. 4,136,736, Cl. 165-162.000.
Smilgys, Bruno S.; Flis, Richard J.; and Devanney, Raymond H., to Veeder Industries Inc. Extended range fuel pump computer price variator. 4,136,573, Cl. 74-348.000.
Smith, Curtis P., to Upjohn Company, The. Compounds and process. 4,137,386, Cl. 260-551.0CD.
Smith, Edward M.: *See*—
Hammett, Daniel E.; and Smith, Edward M., 4,136,744, Cl. 172-60.000.

Smith, Frederick R., to Avtex Fibers Inc. Fibers of high fluid-holding capacity. 4,136,697, Cl. 128-285.000.
Smith, Harold J. Capacitor discharge ignition system. 4,136,659, Cl. 123-148.00E.
Smith, Herman W., to Upjohn Company, The. Cis-4-5-didehydro-13,14-didehydro-11-deoxy-PGE$_1$ compounds. 4,137,247, Cl. 260-408.000.
Smith, Herman W., to Upjohn Company, The. 2-Decarboxy-2-hydroxymethyl-13,14-didehydro-ω-aryl-PG compounds. 4,137,270, Cl. 260-590.00C.
Smith International, Inc.: *See*—
Neilson, William J.; and Rife, Dwight A., 4,136,586, Cl. 76-108.00A.
Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corp. Latent accelerators for curing epoxy resins. 4,137,275, Cl. 260-830.0TW.
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Smith Kline & French Laboratories Limited: *See*—
Durant, Graham J.; Emmett, John C.; and Ganellin, Charon R., 4,137,234, Cl. 260-302.00R.
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Smith, Norman F., to Lucas Industries Limited. Joining a pair of parts. 4,136,813, Cl. 228-224.000.
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Smith, Richard L.; and Farrar, Ralph C., to Phillips Petroleum Company. Continuous solution polymerization of a conjugated diene with a monovinylaromatic compound using alkoxysilicon treating agents in the first reactor means of a reactor series. 4,137,391, Cl. 526-178.000.
Smith, Roy E.: *See*—
Anderson, Joseph W.; Guile, Donald L.; and Smith, Roy E., 4,136,828, Cl. 239-422.000.
Smith, Sidney B., to Lucas Industries Limited. Battery charge detector and charging system including such detector. 4,137,493, Cl. 320-39.000.
Smith, William J. Putting stroke calculator. 4,137,448, Cl. 235-78.00G.
SmithKline Corporation: *See*—
DeMarinis, Robert M., 4,137,314, Cl. 424-246.000.
Snam Progetti S.p.A.: *See*—
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Snelling, Christopher, to Xerox Corporation. Continuous contrast development system. 4,136,637, Cl. 118-658.000.
Sochalski, Henry A., to Thiokol Corporation. Asbestos free friction compositions. 4,137,214, Cl. 260-38.000.
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Lazzerini, Giorgio; Vargiu, Silvio; and Pitzalis, Mario, 4,137,220, Cl. 528-135.000.
Societa Italiana Vetro S/V S.p.A.: *See*—
Ciarniello, Giorgio; and De Lena, Oscar, 4,137,557, Cl. 361-92.000.
Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem: *See*—
Labat, Pierre, 4,136,575, Cl. 74-359.000.
Societe Anonyme dite: Alsthom-Unelec: *See*—
Redon, Georges, 4,137,435, Cl. 200-85.00R.
Societe Anonyme dite: Au Cachet Lorrain: *See*—
Daguise, Dominique D., 4,136,612, Cl. 101-18.000.
Societe Chimique des Charbonnages: *See*—
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Societe d'Etudes de Produits Chimiques: *See*—
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Societe Industrielle de Brevets et d'Etudes, S.I.B.E.: *See*—
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Societe Industrielle de Sonceboz S.A.: *See*—
Pfister, Jean-Francois, 4,137,473, Cl. 310-98.000.
Societe Nationale des Poudres et Explosifs: *See*—
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Sokolov, Sergei S.; Safonov, Viktor K.; and Vlasov, Leonid I., to Tsentralny Nauchno-Issledovatelsky Dizelny Institut. Load control device for turbo-supercharged diesel engines. 4,136,656, Cl. 123-140.0FG.
Solarex Corporation: *See*—
Lindmayer, Joseph, 4,137,095, Cl. 136-89.0SG.
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Soulen, Robert L.: *See*—
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South African Inventions Development Corporation: *See*—
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Southeast Container Corporation: *See*—
Perry, Gerald E., 4,136,817, Cl. 229-33.000.
Southworth, Anna M., to Transmed Corp. Self-contained apparatus for collection and maintenance of medical specimen and methods of using same. 4,136,680, Cl. 128-213.000.
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Blanchart, Alain P. O.; Spaepen, Gustaaf J. F.; and De Brandt, Constantine W. M. V. A., 4,137,371, Cl. 429-29.000.
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Spear, John F.; and Lemon, Maurice C., to Universal Towel Company. Treatment of continuous towels. 4,136,538, Cl. 68-22.00R.
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Spectra-Physics, Inc.: *See*—
Rock, John V., 4,137,011, Cl. 417-22.000.
Spectrum X-Ray Corporation: *See*—
Hogan, William F., 4,137,456, Cl. 250-456.000.
Spencer, David H., to Burroughs Corporation. Intelligent computer display terminal having EAROM memory. 4,137,564, Cl. 364-200.000.
Sperry Rand Corporation: *See*—
Crawford, LeRoy A.; and Trible, Paul S., 4,136,510, Cl. 56-341.000.
Dyke, Calvin J., 4,136,704, Cl. 130-27.00T.
Haas, David L., 4,136,706, Cl. 132-40.000.
Kulpa, Walter J., 4,136,705, Cl. 132-40.000.
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Spodig, Heinrich. Permanent magnetic separator for liquids. 4,137,174, Cl. 210-222.000.
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SPS Technologies, Inc.: *See*—
Thomas, William J., 4,136,416, Cl. 10-10.00R.
Staas, Frans A.; and Severijns, Adrianus P., to U.S. Philips Corporation. ^{3}He-^{4}He Dilution refrigerator. 4,136,531, Cl. 62-502.000.
Staats, Henry N., to General Binding Corporation. Method of making a spiral binder. 4,137,289, Cl. 264-138.000.
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Starkey, Walter D.; and Chaney, Rolland W. Football drier. 4,137,040, Cl. 432-128.000.
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Palios, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,137,070, Cl. 71-100.000.
Sherif, Fawzy G.; and Irani, Mazin R., 4,137,178, Cl. 252-8.100.
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Stecklow, James P. Loose leaf binder with flexible telescopic post assemblies and magnetically retained bar. 4,136,981, Cl. 402-46.000.

Steffen, David E.: *See—*
Anson, James H.; and Steffen, David E., 4,137,529, Cl. 340-684.000.
Steffen, Peter U. Wood-burning stove. 4,136,665, Cl. 126-123.000.
Stein, Claude; and Le Delliou, Patrick, to Societe Chimique des Charbonnages. Method of cold-shaping of mixtures comprising poly[2.2.1-]bicyclo-2-heptene or its short-chain. 4,137,210, Cl. 260-31.20R.
Stein, Hermann, to Steuerungstechnik GmbH. Remote control apparatus for a plurality of controllable objects. 4,137,522, Cl. 340-147.00R.
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Steingroever, Erich A. Magnetic flux standard and method for calibrating fluxmeters. 4,137,498, Cl. 324-202.000.
Steinman, Gerald H. Insulating foam producing and delivering apparatus, and foam gun therefor. 4,137,048, Cl. 422-133.000.
Stephens, Curtis L., to Eastman Kodak Company. Electrophotographic apparatus having compensation for changes in sensitometric properties of photoconductors. 4,136,945, Cl. 355-14.000.
Sterling Drug Inc.: *See—*
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Sterling, Maurice, to Eby Company. Cable clamp and bracket. 4,136,423, Cl. 24-122.600.
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Stiles, Alvin B.; and England, David C., to Du Pont de Nemours, E. I., and Company. Process for oxidation of 1-propanol. 4,137,271, Cl. 260-604.00R.
Stock, Harold R., to Wiese Planning and Engineering, Inc. Apparatus and method for removing tires from wheels. 4,137,101, Cl. 148-9.00R.
Stockdale, Roy, to Napco Security Systems, Inc. Digital dialers for use in the security field. 4,137,429, Cl. 179-5.00R.
Stocker, Kurt F., to Pentapharm A.G. Process for the preparation of thrombin-like enzymes from snake venoms. 4,137,127, Cl. 195-66.00B.
Stocker, Rudolf: *See—*
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Stoler, Moshe. Rotary device particularly useful as a rotary engine. 4,136,647, Cl. 123-45.00R.
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Stolzenberg, Heinz, to KHD Industrieanlagen AG. Means for the measurement of relative movement between loose raceways and a revolving drum mounted in the raceways. 4,137,039, Cl. 432-103.000.
Stonebridge, Arthur L., to BBA Group Limited. Methods of making loops in strip fabric material. 4,137,352, Cl. 428-102.000.
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Storms, William L., to Alpha Nova Development Corp. Wrist band holder for electronic calculator. 4,136,805, Cl. 224-28.00R.
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Straitz, John F., III, to Combustion Unlimited Incorporated. Flare burner. 4,137,036, Cl. 431-202.000.
Strickler, Ernst, to Mettler Instrumente AG. Top-loading balance. 4,136,750, Cl. 177-189.000.
Stroub, Robert H., to United States of America, National Aeronautics and Space Administration. Constant lift rotor for a heavier than air craft. 4,137,010, Cl. 416-51.000.
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Sugiura, Akio; Okamoto, Atutoshi; and Nojiri, Tadao, to Nippondenso Co., Ltd. Method and apparatus for recognizing code information. 4,136,821, Cl. 235-462.000.
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Sulzbach, Reinhard A.; and Oberauer, Georg, to Hoechst Aktiengesellschaft. Process for separating tetrafluoroethylene from nitrogen and carbon monoxide. 4,137,055, Cl. 55-71.000.
Sulzer Brothers Limited: *See—*
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Sumitomo Chemical Company, Limited: *See—*
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Sumitomo Electric Industries, Ltd.: *See—*
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Sumitomo Metal Industries, Ltd.: *See—*
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Sun, Yen S. E., to General Electric Company. Method of controlling leakage currents and reverse recovery time of rectifiers by hot electron irradiation and post-annealing treatments. 4,137,099, Cl. 148-1.500.
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Sunnergren, Carl E.; Simms, John K.; and Brinker, Dale W., to Bethlehem Steel Corporation. Mixer block for use in rotary drums. 4,136,965, Cl. 366-25.000.
Suominen, Jorma; Candolin, Carl-Johan; and Ronnholm, Arvi, to Oy W. Rosenlew Ab. Method for the recovery of sulphur compounds, volatile alcohols, turpentine and the like produced in connection with pulping. 4,137,134, Cl. 203-73.000.
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Ivanov, Jury N.; Suris, Leonid I.; Zaitsev, Nikolai M.; and Shikin, Vladimir G., 4,136,422, Cl. 24-170.000.
Suslin, Vladimir I.; Makeev, Boris A.; Dubovik, Alexandr I.; Lekarev, Zinovy A.; Pilipenko, Vitaly A.; Etnaer, Alexandr I.; Kolesnichenko, Anatoly A.; and Razdymakha, Pavel S., to Nauchno-Issledovatelsky Institut Avtomatizatsii Upravlenia I Proizvodstva Niiap. Apparatus for electrochemical machining of metal parts. 4,137,143, Cl. 204-224.00M.
Suss, Winfried, to Karl Suss KG. Parallelizing gauge in a wedge error correction head. 4,136,459, Cl. 33-180.00R.
Suzaki, Yasuzi, to Hitachi, Ltd. Apparatus for generating light pulse train. 4,136,929, Cl. 350-96.150.
Suzuki, Mituo: *See—*
Sasaki, Takuya; Yamane, Tamotsu; Horibe, Yoshun; and Suzuki, Mituo, 4,136,734, Cl. 165-111.000.
Suzuki, Suzuo; Kawamura, Yoshihisa; and Ezoe, Mitsuhiko, to Nissan Motor Company, Limited. Mass flow rate detector of electrostatic type. 4,136,564, Cl. 73-194.00F.
Suzuki, Yukio: *See—*
Miki, Yoshio; Nishizawa, Hideo; and Suzuki, Yukio, 4,137,362, Cl. 428-337.000.
Suzuki, Yutaka: *See—*
Ito, Osamu; Hobo, Nobuhito; Suzuki, Yutaka; Kawamoto, Itsushi; Naitou, Takashi; Shiozaki, Makoto; and Konishi, Yoshimune, 4,136,645, Cl. 123-32.0EE.
Svacha, Roy E.: *See—*
Godsey, Randall D.; Svacha, Roy E.; Crawford, James V.; and Janowski, Kenneth R., 4,136,428, Cl. 29-157.400.

Sveceny, Alfred, to U.S. Philips Corporation. Magnetic head. 4,137,555, Cl. 360-129.000.
Svenning, B. F. Staffan: *See—*
Johansson, Folke L.; and Svenning, B. F. Staffan, 4,136,853, Cl. 251-282.000.
Svetikov, Ivan P.: *See—*
Mushenko, Nikolai Y.; KLarin, Gennady P.; Seredenko, Vladimir P.; and Svetikov, Ivan P., 4,136,827, Cl. 239-419.300.
Sweet, David L.: *See—*
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,136,893, Cl. 280-678.000.
Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., to American Carrier Equipment, Inc. Motion damper for a walking beam assembly. 4,136,893, Cl. 280-678.000.
Swisher, George W., Jr., to CMI Corporation. Apparatus for simultaneously mixing and conveying particulate material. 4,136,964, Cl. 366-23.000.
Swodenk, Wolfgang: *See—*
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rold; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,137,242, Cl. 260-348.250.
Tachino, Kenzo, to Mitsubishi Denki Kabushiki Kaisha. Speed control system of elevator. 4,136,758, Cl. 187-29.00R.
Takacs, Joseph E.: *See—*
Takacs, Victor C.; and Takacs, Joseph E., 4,137,000, Cl. 407-101.000.
Takacs, Victor C.; and Takacs, Joseph E., to Triangle Grinding, Inc. Cutting tool. 4,137,000, Cl. 407-101.000.
Takahara, Toshiyuki: *See—*
Ono, Koichi; Takahara, Toshiyuki; and Ito, Tetsuyoshi, 4,136,894, Cl. 280-729.000.
Takahashi, Akira, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Dashpot. 4,136,649, Cl. 123-103.00R.
Takahashi, Hideo; Aikawa, Kazuhisa; and Horie, Masakatsu, to Fujitsu Limited. Electrostatic transfer process and apparatus for carrying out the same. 4,137,537, Cl. 346-159.000.
Takahashi, Kihei, to Yoshida Kogyo K.K. Bridge top stop for slide fasteners. 4,136,424, Cl. 24-205.11R.
Takahashi, Kozo: *See—*
Murakami, Masuo; Takahashi, Kozo; and Ozasa, Teruaki, 4,137,407, Cl. 544-28.000.
Takahashi, Miyoshi: *See—*
Sato, Masaki; Watanabe, Mashatoshi; Takahashi, Noriyoshi; and Takahashi, Miyoshi, 4,137,471, Cl. 310-51.000.
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Takashima, Yoshinori: *See—*
Kudo, Shiro; Ishino, Keizo; and Takashima, Yoshinori, 4,137,339, Cl. 426-634.000.
Takashina, Hideo: *See—*
Fujita, Tadashi; Oya, Masayuki; Takashina, Hideo; and Iso, Tadashi, 4,137,420, Cl. 562-426.000.
Takeda Chemical Industries, Ltd.: *See—*
Hashimoto, Naoto; and Kishi, Toyokazu, 4,137,230, Cl. 260-239.30P.
Takeda, Hiroo: *See—*
Mohri, Michihiro; Takeda, Hiroo; Tsunemi, Masaaki; Uchiumi, Tadashi; and Kanda, Takeshi, 4,137,162, Cl. 210-40.000.
Takeda, Kunihiko: *See—*
Miyake, Tetsuya; Takeda, Kunihiko; Miyata, Naoki; Saeki, Tatsushi; and Seko, Maomi, 4,137,054, Cl. 55-33.000.
Takemura, Akira; and Utsumi, Tadao, to Kabushiki Kaisha Yamashina Seikosho. Drill screw and die for producing same. 4,136,597, Cl. 85-41.000.
Tamers, Murry A. Carbide production using molten metals as heat source. 4,137,295, Cl. 423-439.000.
Tamura, Yasuyuki: *See—*
Nakahata, Kimio; and Tamura, Yasuyuki, 4,136,942, Cl. 355-3.0CH.
Tanaka, Keigo; and Morita, Yoshiyuki, to Nippondenso Co., Ltd. Electric control system for diesel engine. 4,136,657, Cl. 123-140.00R.
Tanaka, Shigenori; Tojo, Akio; and Honya, Takao, to Nissan Motor Company, Limited. Air guiding comb tooth for air jet weaving loom. 4,136,716, Cl. 139-435.000.
Tange, Shinji; and Matsuura, Akihiro, to Toyoda-Koki Kabushiki-Kaisha. Apparatus for preventing circumferential overspeeding of a grinding wheel. 4,136,490, Cl. 51-134.50R.
Tanigaki, Yasushi: *See—*
Hayamizu, Mamoru; and Tanigaki, Yasushi, 4,136,949, Cl. 356-1.000.
Tanner, Lee E.: *See—*
Ray, Ranjan; Tanner, Lee E.; and Cline, Carl F., 4,137,075, Cl. 75-174.000.
Tanoshima, Katsuhide: *See—*
Watanabe, Akinori; Nagano, Akio; and Tanoshima, Katsuhide, 4,136,611, Cl. 101-1.000.
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., to Schering Corporation. Process for the preparation of antibiotic W-10 complex and for the isolation of antibiotic 20561 and antibiotic 20562 therefrom. 4,137,224, Cl. 260-112.50R.
Tassone, Joseph V. Ball tee. 4,136,869, Cl. 273-26.00R.
Tateda, Koichi, to Sharp Kabushiki Kaisha. High-frequency oven having a browning unit. 4,137,442, Cl. 219-10.55B.
Tateishi, Yasuo, to Hita Chi Metals, Ltd. Travelling precipitate collector. 4,137,170, Cl. 210-112.000.
Tateno, Hiroshi: *See—*
Komamiya, Yasuo; Tateno, Hiroshi; Kataoka, Shoei; and Mititada, Morisue, 4,137,569, Cl. 364-784.000.
Taul, Niels A., to Massey-Ferguson Inc. Corner structure. 4,136,985, Cl. 403-172.000.
Taylor, James F.: *See—*
Mendoza, Gregory E.; Henthorn, Donald R.; and Taylor, James F., 4,136,521, Cl. 60-477.000.
Taylor, John W., Jr.; and Martin, Raymond G., to Westinghouse Electric Corp. VIP doppler filter bank signal processor for pulse doppler radar. 4,137,532, Cl. 343-7.700.
Teche, Andre: *See—*
Perronnet, Jacques; Demoute, Jean-Pierre; Girault, Pierre; and Teche, Andre, 4,137,068, Cl. 71-98.000.
Tedeschi, Enzo, to Plantex, Ltd. Pharmaceutical compositions containing imidazo(2,1-b)thiazoles and process for reducing blood sugar levels therewith. 4,137,320, Cl. 424-270.000.
Teijin Limited: *See—*
Hara, Shigeyoshi; and Yamada, Tateyoshi, 4,137,221, Cl. 528-273.000.
Tektronix, Inc.: *See—*
Janko, Bozidar, 4,137,479, Cl. 313-426.000.
Telford, James W., to Board of Regents University of Nevada System. Pivoted blade barrel rotor wind turbine. 4,137,009, Cl. 416-24.000.
Tennenhouse, Clifford C.; and Olshansky, Leonard. Liquid level sensing device. 4,137,527, Cl. 340-620.000.
Terahara, Akira: *See—*
Endo, Akira; Terahara, Akira; Kitano, Noritoshi; Ogiso, Akira; and Mitsui, Seiji, 4,137,322, Cl. 424-273.00R.
Teratani, Tatsuo: *See—*
Kuroyanagi, Yoshitaka; and Teratani, Tatsuo, 4,137,501, Cl. 325-313.000.
Terman, Lewis M.: *See—*
Heller, Lawrence G.; and Terman, Lewis M., 4,137,464, Cl. 307-227.000.
Terzian, Rouben T.: *See—*
Shackelford, Judy; and Terzian, Rouben T., 4,136,483, Cl. 46-135.00R.
Testa, Raymond T.: *See—*
Taplin, David; Weinstein, Marvin J.; Testa, Raymond T.; Marquez, Joseph A.; and Patel, Mahesh G., 4,137,224, Cl. 260-112.50R.
Tetradyne Corporation: *See—*
Mueller, Frederick N.; and Chandler, Ronald W., 4,136,561, Cl. 73-171.000.
Mueller, Frederick N.; and Chandler, Ronald W., 4,136,563, Cl. 73-194.00E.
Tettamanti, Dante, to Wire Rope Industries Ltd. Mechanical splice for wire strands. 4,136,987, Cl. 403-212.000.
Teunissen, Antonius J. J. M.: *See—*
Van Geem, Paul C.; and Teunissen, Antonius J. J. M., 4,137,259, Cl. 562-415.000.
Texaco Development Corporation: *See—*
Burns, Robert B., 4,136,996, Cl. 405-195.000.
Edwards, Gayle D.; Rice, Doris M.; and Soulen, Robert L., 4,137,265, Cl. 260-570.900.
Texaco, Inc.: *See—*
Brown, Winthrop K., 4,136,559, Cl. 73-136.00A.
Haynes, Stewart, Jr.; Lim, Frank H.; and Alston, Robert B., 4,136,738, Cl. 166-273.000.
Howard, Curtis E.; Calvin, Douglas G.; and Pitts, Robert W., Jr., 4,136,737, Cl. 166-251.000.
Larkin, John M., 4,137,254, Cl. 260-465.00E.
Paap, Hans J.; Arnold, Dan M.; and Scott, Hubert D., 4,137,452, Cl. 250-270.000.
Reid, Robert E.; and Zang, Hyung K., 4,137,267, Cl. 260-583.00P.
Texas Instruments Incorporated: *See—*
Aiken, James G.; and Sloan, Benjamin J., Jr., 4,137,109, Cl. 148-175.000.
Caudel, Edward R., 4,137,499, Cl. 325-67.000.
Kilby, Jack S.; Lathrop, Jay W.; and Porter, Wilbur A., 4,136,436, Cl. 29-572.000.
Textron, Inc.: *See—*
Bernier, Lornie J.; and Das, Tapan K., 4,137,043, Cl. 8-4.000.
Davis, Samuel B., Jr., 4,136,596, Cl. 85-7.000.
Moertel, George B., 4,137,034, Cl. 425-545.000.
TH. Goldsmith AG: *See—*
Koerner, Gotz; and Patzke, Hans-Jurgen, 4,137,179, Cl. 252-8.600.
Then, Gebhard; and Spiller, Gerhard, to Preh, Elektro-Feinmechanische Werke, Jakob Pre Nachf. Multiple-contact connector for a printed circuit board. 4,136,917, Cl. 339-17.00L.
Therminser Manufacturing Corporation: *See—*
McCown, Letcher I.; and Soderlund, Ernest H., 4,136,676, Cl. 126-292.000.
Theysohn, Rainer; Penzien, Klaus; Seydl, Wolfgang; Wurmb, Rolf; Reimann, Horst; Cordes, Claus; and Sterzel, Hans-Josef, to BASF Aktiengesellschaft. Flameproofed nylon molding compositions. 4,137,212, Cl. 260-37.00N.
Thibault, Louis R.; and Yau, Leopoldo D., to Bell Telephone Laboratories, Incorporated. Fabrication of small contact openings in large-scale-integrated devices. 4,136,434, Cl. 29-571.000.
Thiokol Corporation: *See—*
Endicott, David W., Jr.; Denton, Charles L.; and Levinthal, Michael L., 4,137,255, Cl. 260-467.000.
Sochalski, Henry A., 4,137,214, Cl. 260-38.000.
Thomas, William J., to SPS Technologies, Inc. Method of producing a vibration resistant fastener. 4,136,416, Cl. 10-10.00R.

Thompson, Alfred L. Spreader device with disposable bags. 4,136,900, Cl. 294-19.00R.

Thompson, Harwell B.; and Young, William H., to Timex Corporation. Sealed watch case and method of making. 4,136,515, Cl. 58-90.00R.

Thomson-CSF: *See*—
Desormiere, Bernard; and Volluet, Gerard, 4,137,470, Cl. 310-26.000.

Thorp, Anthony J.; Clamp, Frank; Feld, Raoul; Page-Gibson, Joseph E.; and Archer, Keith, to Laporte Industries Limited. Process for the production of titanium disulphide. 4,137,297, Cl. 423-561.00R.

Thyssen Industrie AG: *See*—
Koppers, Manfred, 4,136,999, Cl. 405-295.000.

Tillmanns, Harald: *See*—
Pietzka, Gerhard; and Tillmanns, Harald, 4,137,150, Cl. 208-106.000.

Timex Corporation: *See*—
Thompson, Harwell B.; and Young, William H., 4,136,515, Cl. 58-90.00R.

Timken Company, The: *See*—
Dickerhoff, Ronald P., 4,136,748, Cl. 175-337.000.
Musselman, Lawrence L.; Harbottle, William E.; and Berecek, Joseph P., 4,136,916, Cl. 308-213.000.

Timmermann, Christian, to Robert Bosch GmbH. Method of forming a lens at the end of a light guide. 4,137,060, Cl. 65-31.000.

Titov, Dmitry V.: *See*—
Komarov, Jury I.; Lukhmanov, Viktor M.; Kudryavtsev, Evgeny P.; Titov, Dmitry V.; and Kovalev, Gennady I., 4,136,717, Cl. 139-436.000.

Tobias, Lamar K.; and Motyka, Jerry J., to Tobias, Lamar K. Method and mechanism for conversion of free access ice chests to provide controlled dispensing of ice. 4,136,803, Cl. 222-413.000.

Todd, David B., to Baker Perkins Inc. Multi-screw, continuous, material processing systems. 4,136,968, Cl. 366-85.000.

Todt, Klaus H.: *See*—
Naik, Appaya R.; Todt, Klaus H.; and Wells, Martin A., 4,137,180, Cl. 252-8.800.

Tojo, Akio: *See*—
Tanaka, Shigenori; Tojo, Akio; and Honya, Takao, 4,136,716, Cl. 139-435.000.

Tokitsu, Naoki; and Saito, Muneo, to Nippondenso Co., Ltd. Method and apparatus for magnetically recording vehicle running conditions. 4,137,553, Cl. 360-6.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Sawaoka, Eiji, 4,136,941, Cl. 355-3.00R.

Tolley, William K., to UOP Inc. Purification of titanium trichloride. 4,137,292, Cl. 423-75.000.

Tominaga, Satoshi: *See*—
Nakamura, Norio; Tominaga, Satoshi; Kobayashi, Tsuneo; and Nagaoka, Mitsuo, 4,137,090, Cl. 106-106.000.

Tomy Kogyo Co., Inc.: *See*—
Matsumoto, Takao, 4,136,872, Cl. 273-85.00H.

Topel, Kenneth D. Adjustable crosshair sight for archery bow. 4,136,462, Cl. 33-265.000.

Toray Industries, Inc.: *See*—
Kanamaru, Naokatu; Imai, Kazuo; and Fujino, Hisaaki, 4,137,113, Cl. 156-187.000.

Torf, Samuil F.: *See*—
Khromov-Borisov, Nikolai V.; Torf, Samuil F.; Cherepanova, Valentina P.; and Danilov, Anatoly F., 4,137,239, Cl. 260-326.820.

Torita, Tomohiko; Okada, Toru; and Yokota, Yuji, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Card processing apparatus. 4,136,819, Cl. 235-431.000.

Torre, Alton J.; Retsky, Michael W.; Gioia, Norman F.; and Amin, Ramesh G., to Zenith Radio Corporation. Television picture tube with cathode coating erosion suppression. 4,137,480, Cl. 313-481.000.

Torre, Jean-Pierre: *See*—
Chanin, Gerald; and Torre, Jean-Pierre, 4,136,526, Cl. 62-48.000.

Towmotor Corporation: *See*—
Friesen, Larry D.; and Palmer, Stephen L., 4,136,752, Cl. 180-101.000.

Townsend, Robert H.; and Kockler, Barry C., to Xerox Corporation. Tracking mount assembly. 4,137,449, Cl. 235-485.000.

Toyo Jozo Co., Ltd.: *See*—
Tsuchihashi, Genichi; Ogura, Katsuyuki; Yaso, Masao; Kuramoto, Masashi; Fujii, Tadashiro; and Watanabe, Tetsuo, 4,137,406, Cl. 544-27.000.

Toyo Press Co., Ltd.: *See*—
Mitsuo, Masaru; and Isayama, Sigeharu, 4,136,607, Cl. 99-329.00R.

Toyo Soda Manufacturing Co., Ltd.: *See*—
Kawakami, Noboru; Goto, Takeshi; Hirano, Itsuo; and Itakura, Yoichi, 4,137,072, Cl. 75-58.000.

Toyoda-Koki Kabushiki-Kaisha: *See*—
Tange, Shinji; and Matsuura, Akihiro, 4,136,490, Cl. 51-134.50R.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Kuroyanagi, Yoshitaka; and Teratani, Tatsuo, 4,137,501, Cl. 325-313.000.
Nogami, Tomoyuki; and Tsubouchi, Kaoru, 4,136,712, Cl. 137-558.000.

Tozawa, Katsutoshi: *See*—
Uetake, Shigeru; Tozawa, Katsutoshi; and Sato, Keiji, 4,137,188, Cl. 252-62.10P.

Trabucco, Hector O. Catheter-type electrode member for an implantable pacemaker. 4,136,702, Cl. 128-418.000.

Traise, John E., to Moore Business Forms, Inc. Faulty window construction detecting apparatus. 4,137,528, Cl. 340-675.000.

Transmed Corp.: *See*—
Southworth, Anna M., 4,136,680, Cl. 128-213.000.

Tratz, Herbert; Welch, Richard; and Hoffmann, Jurgen, to Kraftwerk Union Aktiengesellschaft. Tube heat exchanger with heating tubes. 4,136,644, Cl. 122-32.000.

Travis, Charles F. Method of making impact delivery in striking members from compressed wood veneers. 4,136,722, Cl. 144-317.000.

Traynor, Sean G., to SCM Corporation. Terpene hydroxysulfonic acids and corresponding hydroxysulfonate salts. 4,137,257, Cl. 260-503.000.

Tri-Texas, Inc.: *See*—
Kent, Jerry B., 4,137,206, Cl. 260-29.60B.

Triangle Grinding, Inc.: *See*—
Takacs, Victor C.; and Takacs, Joseph E., 4,137,000, Cl. 407-101.000.

Trible, Paul S.: *See*—
Crawford, LeRoy A.; and Trible, Paul S., 4,136,510, Cl. 56-341.000.

Tripp, Dwight E., to Weed Eater, Inc. Rotary cutting assembly with mechanical line feed. 4,136,446, Cl. 30-276.000.

Triumph Werke Nurnberg A.G.: *See*—
Krauss, Otto; and Lendl, Josef, 4,136,977, Cl. 400-120.000.

Troup, George: *See*—
Hansen, Arne; and Troup, George, 4,136,851, Cl. 251-63.000.

Troxler, Franz: *See*—
Berthold, Richard; and Troxler, Franz, 4,137,331, Cl. 424-267.000.

Trueb, Werner, to Sandoz Ltd. Unsaturated diesters of β-haloethanephosphonates and dithiophosphonates as plant growth regulator. 4,137,064, Cl. 71-86.000.

Trummlitz, Gunter; Engel, Wolfhard; Seeger, Ernst; Haarmann, Walter; and Engelhardt, Gunther, to Boehringer Ingelheim GmbH. 2,5-Dihydro-1,2-thiazino(5,6-b)indole-3-carboxamide-1,1-dioxides and salts thereof. 4,137,313, Cl. 424-246.000.

Truth Incorporated: *See*—
Van Klompenburg, Marlo G., 4,136,578, Cl. 74-520.000.

TRW, Inc.: *See*—
Hodge, Malcolm H., 4,137,519, Cl. 338-308.000.

Tschek, Wolfgang: *See*—
Lohr, Alfred; and Tschek, Wolfgang, 4,137,337, Cl. 426-637.000.

Tschentscher, Alfred, to FMN Schuster & Company. Method and device for inserting threads, yarns and the like into a winding device. 4,136,834, Cl. 242-18.0PW.

Tsentralny Nauchno-Issledovatelsky Dizelny Institut: *See*—
Sokolov, Sergei S.; Safonov, Viktor K.; and Vlasov, Leonid I., 4,136,656, Cl. 123-140.0FG.

Tsubouchi, Kaoru: *See*—
Nogami, Tomoyuki; and Tsubouchi, Kaoru, 4,136,712, Cl. 137-558.000.

Tsuchida, Eishun; and Osada, Yoshihito, to Tsuchida, Eishun. Polyion complex and method for preparing the same. 4,137,217, Cl. 260-837.00R.

Tsuchihashi, Genichi; Ogura, Katsuyuki; Yaso, Masao; Kuramoto, Masashi; Fujii, Tadashiro; and Watanabe, Tetsuo, to Sagami Chemical Research Center; and Toyo Jozo Co., Ltd. Cephalosporins having a sulfur containing functional group in the 7-position side chain. 4,137,406, Cl. 544-27.000.

Tsuchimoto, Masashi: *See*—
Nagata, Koichi; Miyazawa, Kokichi; Sato, Takeshi; Tsuchimoto, Masashi; and Kawashima, Junichi, 4,137,293, Cl. 423-140.000.

Tsunekawa, Tokuichi: *See*—
Mashimo, Yukio; Uchidoi, Masanori; Yamamichi, Masayoshi; Ito, Fumio; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,137,541, Cl. 354-23.00D.

Tsunemi, Masaaki: *See*—
Mohri, Michihiro; Takeda, Hiroo; Tsunemi, Masaaki; Uchiumi, Tadashi; and Kanda, Takeshi, 4,137,162, Cl. 210-40.000.

Tsunoda, Takashi, to Canon Kabushiki Kaisha. Circuitry for reducing power dissipation in equipment which operates in synchronism with clock pulses. 4,137,563, Cl. 364-200.000.

Tucker, Percy A. Apparatus and method for inserting indicia into pens. 4,136,431, Cl. 29-451.000.

Tufte, Obert N.: *See*—
Heaps, Joseph D.; and Tufte, Obert N., 4,137,355, Cl. 428-201.000.

Tummers, Gerardus L. J.: *See*—
Couch, Thomas W.; Harvey, James A.; and Tummers, Gerardus L. J., 4,137,049, Cl. 422-56.000.

Tuschy, Eckhard; and Wischmeyer, Georg, to Kabel-und Metallwerke Gutehoffnungshuette AG. Skew rolling mill. 4,136,543, Cl. 72-78.000.

Tusing, Arthur P. Bearing assembly for farm implements incorporating rotatable discs. 4,136,746, Cl. 172-599.000.

Tyler, Robert P., to Wallace Murray Corporation. Cutting tool. 4,136,594, Cl. 83-839.000.

Tyler, William R., Jr., to Brown & Williamson Tobacco Corporation. Portable bale press. 4,136,610, Cl. 100-100.000.

Tyrrel, Sylvan F. Signal converter. 4,137,525, Cl. 340-347.0AD.

U C B, Societe Anonyme: *See*—
Rodriguez, Ludovic; Leclercq, Jacques; Ykman, Pierre; and Cossement, Eric, 4,137,236, Cl. 260-306.70C.

Uarco Incorporated: *See*—
McKinzie, Richard E.; and Juszak, Joseph J., 4,136,895, Cl. 282-9.00R.

Uchidoi, Masanori: *See*—
Mashimo, Yukio; Uchidoi, Masanori; Yamamichi, Masayoshi; Ito, Fumio; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,137,541, Cl. 354-23.00D.

Uchiumi, Tadashi: *See*—
Mohri, Michihiro; Takeda, Hiroo; Tsunemi, Masaaki; Uchiumi, Tadashi; and Kanda, Takeshi, 4,137,162, Cl. 210-40.000.

Ueda, Tadao; Nagaya, Teruo; and Kawada, Koji, to Asahi Denka Kogyo Kabushiki Kaisha. Method for electrolyzing alkali metal halide aqueous solution. 4,137,136, Cl. 204-98.000.
Uerdingen, Walter: *See—*
Wingler, Frank; Pedain, Josef; and Uerdingen, Walter, 4,137,389, Cl. 526-86.000.
Uetake, Shigeru; Tozawa, Katsutoshi; and Sato, Keiji. Magnetic toner for electrophotography. 4,137,188, Cl. 252-62.10P.
Uhrner, Klaus-Jurgen, to Kupfer-Asbest-Co. Gustav Bach. Axial shaft sealing unit for sealing a stationary machine part relative to a rotatable machine part. 4,136,885, Cl. 277-9.500.
Union Carbide Corporation: *See—*
Larrabee, Edward W., 4,136,818, Cl. 233-1.00R.
Moked, Isaac; Handwerk, Richard H.; and Marshall, Walter R., 4,137,023, Cl. 418-15.000.
Smith, Oliver W.; and Koleske, Joseph V., 4,137,279, Cl. 260-861.000.
Uniroyal, Inc.: *See—*
Blaskiewicz, Arthur A.; and Mitchell, Julian M., 4,137,350, Cl. 428-31.000.
Hartz, Roy E., 4,137,358, Cl. 428-272.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State of Defence in Her Britannic Majesty's Government of the: *See—*
Hilsum, Cyril; Kirton, John; and Mears, Adrian L., 4,137,481, Cl. 313-503.000.
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Lenker, Don H.; Nascimento, Dennis F.; and Adrian, Paul A., 4,136,509, Cl. 56-327.00R.
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Fowler, Steven E., 4,136,617, Cl. 102-220.000.
Grant, James B.; and McCoubrey, George A., 4,137,008, Cl. 416-20.00R.
Leone, Stephen R.; and Kosnik, Kenneth G., 4,137,509, Cl. 331-94.50G.
Murray, Kenneth M., 4,137,461, Cl. 250-526.000.
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Acket, Gerard A., 4,137,122, Cl. 156-601.000.
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Hinz, Hans-Dieter; and Rothgordt, Ulf, 4,137,536, Cl. 346-155.000.
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Cutter, Louis A., 4,137,388, Cl. 526-73.000.
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Briechle, George T.; Di Domizio, John A.; and Weindling, Frederik, 4,137,533, Cl. 343-7.700.
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Antos, George J., 4,137,153, Cl. 208-139.000.
Bjorklund, Bradford L., 4,137,129, Cl. 203-26.000.
Emmons, Roger D., 4,137,357, Cl. 428-245.000.
Godsey, Randall D.; Svacha, Roy E.; Crawford, James V.; and Janowski, Kenneth R., 4,136,428, Cl. 29-157.400.
Shum, Ming S., 4,136,427, Cl. 29-157.400.
Tolley, William K., 4,137,292, Cl. 423-75.000.
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Hoeksema, Herman, 4,137,410, Cl. 544-101.000.
Sanson, Joseph F., 4,137,030, Cl. 425-388.000.
Smith, Curtis P., 4,137,386, Cl. 260-551.0CD.
Smith, Herman W., 4,137,247, Cl. 260-408.000.
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Mikulicz, Michael Z.; and Burton, Vance P., 4,137,274, Cl. 260-683.15C.
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Chadha, Naresh K.; Partridge, John J., Jr.; and Uskokovic, Milan R., 4,137,244, Cl. 260-395.000.
USM Corporation: *See—*
Ettinger, Donald H., 4,137,445, Cl. 219-98.000.
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Van Doorn, Donald W.; Hawkins, James B.; Williams, Roy T.; and Pease, William C., III, to Lummus Industries, Inc. Baling press controls. 4,136,609, Cl. 100-51.000.
Van Duzee, Barry F., to Procter & Gamble Company, The. Therapeutic treatment. 4,137,309, Cl. 424-204.000.
Van Gasse, Rene L. E., to Stamicarbon, B.V. Process for preparing decorative plastics articles, as well as products prepared according to the process. 4,137,215, Cl. 260-40.00R.
Van Geem, Paul C.; and Teunissen, Antonius J. J. M., to Stamicarbon, B.V. Catalytic gas phase oxidation of toluene to benzaldehyde and/or benzoic acid. 4,137,259, Cl. 562-415.000.
Van Klompenburg, Marlo G., to Truth Incorporated. Closure operator. 4,136,578, Cl. 74-520.000.
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Caryotakis, George; Chan, George; Falce, Louis R.; Luebke, William R., deceased; and Wood, Walter, 4,137,482, Cl. 315-3.500.
Varlamov, Vladimir M.; Sopin, Anatoly I.; Judaev, Vasily F.; Romanov, Jury P.; Kokarev, Dmitry T.; Metelyagin, Alexandr Z.; Shestakov, Vladislav A.; Fomin, Vladimir I.; and Filin, Vladimir A. Apparatus for creating acoustic oscillations in a running liquid medium. 4,136,971, Cl. 366-169.000.
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Boeck, Joachim; Dunker, Peter; Fryen, Jurgen; Neumann, Dietrich; Pattberg, Georg; and Wieseke, Udo, 4,137,562, Cl. 364-200.000.
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Idel, Karsten; Vernaleken, Hugo; Freitag, Dieter; Reiff, Gunther; and Rudolph, Hans, 4,137,219, Cl. 528-177.000.
Verstraeten, Alexander J. Hydraulic pile driver. 4,136,520, Cl. 60-371.000.
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Vertucci, Nicholas E., to William Chillianis. Combination leg shield and crash bar for motorcycles. 4,136,890, Cl. 280-289.00S.
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Haramoto, Yutaka; Fujii, Yasuhiko; and Yamazaki, Masami, 4,137,507, Cl. 330-302.000.
Iwahara, Makoto, 4,137,510, Cl. 333-6.000.
Muraoka, Teruo; and Seki, Kohji, 4,137,430, Cl. 179-100.40C.
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Viking Corporation, The: *See*—
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Villa, Carlo. Knitting machine. 4,136,534, Cl. 66-84.00A.
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Vladimirov, Alexandr S.: *See*—
Barbashin, Oleg A.; Okunev, Alexandr A.; Mikhailov, Sergei K.; Mochalov, Lev E.; Orlov, Lev P.; Shenderov, Lev B.; Shelepov, Nikolai S.; Dubodin, Vissarion M.; Vladimirov, Alexandr S.; and Gorynin, Igor V., 4,137,422, Cl. 13-9.00R.
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Sokolov, Sergei S.; Safonov, Viktor K.; and Vlasov, Leonid I., 4,136,656, Cl. 123-140.0FG.
Vogel, Kenneth E.; and Powlas, Jerome D., to McQuay-Perfex Inc. Refrigeration system subcooling control. 4,136,528, Cl. 62-174.000.
Vogt, Albert B. Optical lens blocking method and apparatus. 4,136,727, Cl. 164-112.000.
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Volpe, Anthony R.: *See*—
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von Allmen, Pierre, to Esco S.A. Grinding and polishing machine. 4,136,489, Cl. 51-98.0BS.
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Vorobeichikov, Leonid T.; and Golovnya, Vitaly G., to Gosudarstvenny Vsesojuzny Institut po Proektirovaniju i Nauchno-Issledovatelskim rabotam "JUZHGIPROTSEMENT". Clinker roasting plant. 4,137,038, Cl. 432-77.000.
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Maddaloni, Ciro, 4,137,502, Cl. 325-455.000.
Voytko, James E.: *See*—
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Wood, Louis L.; and Frisch, Kurt C., 4,137,200, Cl. 521-159.000.
W. Schlafhorst & Co.: *See*—
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WABCO Westinghouse G.m.b.H.: *See*—
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Wagner, Howard G.: *See*—
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Walser, Armin; and Fryer, Rodney I., to Hoffmann-La Roche Inc. Process for preparing imidazo[1,5-A][1,5]benzodiazepines. 4,137,229, Cl. 260-239.30T.
Walter, Erhard P., to David, Howard C., a part interst. Golf ball retriever. 4,136,901, Cl. 294-19.00A.
Walter, Karl, to AGFA-Gevaert AG. Cassette for tape, particularly light-sensitive tape. 4,136,839, Cl. 242-71.100.
Walter, Thomas J., to Ethyl Corporation. Process for precipitation of carboxyalkoxy succinate tetrahydrate salt. 4,137,260, Cl. 562-580.000.
Walters, John M., to Westinghouse Electric Corp. Method of welding nuclear reactor fuel assemblies. 4,137,125, Cl. 176-78.000.
Walther, Hans J.; and Gdulla, Manfred, to Dragerwerk Aktiengesellschaft. Head guard assembly comprising a protective helmet and a protective breathing mask. 4,136,403, Cl. 2-10.000.
Wang, Guang T., to American Cyanamid Company. Method for the control of cattle grubs employing a phenylene bis[imino(thio)carbonyl)diphosphor(thio)-amidic acid ester. 4,137,310, Cl. 424-204.000.
Wang, Richard H. S.: *See*—
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Ward, John J. B.; and Barnes, Clive, to BNF Metals Technology Centre. Chromite coatings, electrolytes, and electrolytic method of forming the coatings. 4,137,132, Cl. 204-38.00R.
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Watson, Lewis A., to Dr. C. Otto & Comp. G.m.b.H. Battery of horizontal coke ovens and method for operating the same. 4,137,128, Cl. 202-256.000.
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Weber, Harold J. Frequency dependent amplitude modulated exciter apparatus. 4,137,500, Cl. 325-141.000.
Weber, Peter, to Givaudan Corporation. Process for preparing glucose isomerase using streptomyces glaucescens mutants. 4,137,126, Cl. 195-66.00R.
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Werner, Friedrich; Putter, Rolf; and Wenzl, Peter, to Bayer Aktiengesellschaft. Process for the preparation of 2-hydroxycarbazoles. 4,137,238, Cl. 260-315.000.
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White, Ralph L., Jr.; and Wright, George C., to Morton-Norwich Products, Inc. Quaternary ammonium salts of dantrolene and clodanolene. 4,137,402, Cl. 542-420.000.
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Wiess, Wilhelm: *See*—
Kronseder, Hermann; and Wiess, Wilhelm, 4,136,719, Cl. 141-1.000.
Wik-It Electronics Corporation: *See*—
Chaikin, Saul W., 4,137,369, Cl. 428-624.000.
Wildman, George T.; and Datta, Rathin, to Merck & Co., Inc. Isolation of antibiotic Cephamycin C. 4,137,405, Cl. 544-20.000.
Wilhelm, Manfred. Air mattress. 4,136,412, Cl. 5-344.000.
Wilkin, Douglas G. Vibrating exercising wheel. 4,136,867, Cl. 272-127.000.
Wilkinson Sword Limited: *See*—
Rowsell, David G.; and Hems, Roger, 4,137,304, Cl. 424-54.000.
Rowsell, David G.; and Hems, Roger, 4,137,305, Cl. 424-54.000.
Willans, Robert D. H., to Cominco Ltd. Automatic stripping of cathode zinc. 4,137,130, Cl. 204-12.000.
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, to Cincinnati Milacron, Inc. Method of inhibiting skin irritation. 4,137,301, Cl. 424-45.000.
William Chillianis: *See*—
Vertucci, Nicholas E., 4,136,890, Cl. 280-289.00S.
William H. Rorer, Inc.: *See*—
Klein, Robert W.; and Nuss, George W., Jr., 4,137,311, Cl. 424-240.000.
Williams, Fred G., Jr.: *See*—
Mullerheim, Steven B.; and Williams, Fred G., Jr., 4,137,062, Cl. 71-9.000.
Williams, Roy T.: *See*—
Van Doorn, Donald W.; Hawkins, James B.; Williams, Roy T.; and Pease, William C., III, 4,136,609, Cl. 100-51.000.
Willingham, John H. Industrialized building construction. 4,136,492, Cl. 52-79.700.
Wilson, Allan C. Wood burning stove. 4,136,662, Cl. 126-61.000.
Wilson, Alexander I., to Hille Engineering Company Limited. Rolling mill stand. 4,136,545, Cl. 72-238.000.
Wilson, Charles D., to J. I. Case Company. Quick attachment device for a lifting tractor. 4,136,792, Cl. 214-145.00A.
Wilson, Robert W., to Powell Manufacturing Company, Inc. Tobacco bulk curing container sections and composite barn construction formed thereby. 4,136,465, Cl. 34-210.000.
Wilson, Walter, to Eaton Corporation. Hoist brake wear indicator. 4,136,634, Cl. 188-1.00A.
Wingler, Frank; Pedain, Josef; and Uerdingen, Walter, to Bayer Aktiengesellschaft. Low-molecular weight acrylate resins and a process for their production. 4,137,389, Cl. 526-86.000.
Winter, August; and Ott, Anton, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Continuously adjustable transmission with two speed ranges. 4,136,581, Cl. 74-689.000.
Wire Rope Industries Ltd.: *See*—
Tettamanti, Dante, 4,136,987, Cl. 403-212.000.
Wirthwein, Rold: *See*—
Prescher, Gunter; Schreyer, Gerd; Weiberg, Otto; Wirthwein, Rold; Waldmann, Helmut; Seifert, Hermann; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,137,242, Cl. 260-348.250.
Wischmeyer, Georg: *See*—
Tuschy, Eckhard; and Wischmeyer, Georg, 4,136,543, Cl. 72-78.000.
Wise, David S., to McGraw-Hill, Inc. Optical projection apparatus. 4,136,938, Cl. 353-78.000.
Wisz, Adam. Outboard motor carrier. 4,136,806, Cl. 224-42.45R.
Witschard, Gilbert: *See*—
Lemper, Anthony L.; Witschard, Gilbert; and Pattison, Victor A., 4,137,216, Cl. 260-42.140.
Wittkampf, Frederik H. M., to Vitatron Medical B.V. Atrial lead and method of inserting same. 4,136,703, Cl. 128-419.00P.
Wohlfarth, Ernst; Hechtl, Wolfgang; and Hittmair, Paul, to Wacker-Chemie GmbH. Silicon-tin compounds. 4,137,249, Cl. 260-429.700.
Wolbrink, David W., to Broan Manufacturing Co., Inc. Wall mounted ventilating device. 4,136,606, Cl. 98-33.00A.
Wong, Robert; and Flautt, Martin C., to Owens-Corning Fiberglas Corporation. Glass fiber size composition. 4,137,209, Cl. 260-29.6NR.
Wood, Louis L.; and Frisch, Kurt C., to W. R. Grace & Co. Crosslinked hydrophilic foams and method. 4,137,200, Cl. 521-159.000.
Wood, Walter: *See*—
Caryotakis, George; Chan, George; Falce, Louis R.; Luebke, William R., deceased; and Wood, Walter, 4,137,482, Cl. 315-3.500.
Wood, Walter E.: *See*—
Honnaker, Leland R.; Jones, Gary L.; and Wood, Walter E., 4,137,032, Cl. 425-464.000.
Woodland, James H. R.: *See*—
Brown, Michael J.; Resnick, Bruce M.; and Woodland, James H. R., 4,137,332, Cl. 424-326.000.
Woodroff, Victor C.; and Walford, John S., to Jetaire Company Limited. Heaters. 4,137,041, Cl. 432-222.000.
Woodruff, Frank, to Bendix Corporation, The. Variable displacement piston pump. 4,137,013, Cl. 417-222.000.
Workman, John, to S.B.W. Engineers Limited. Cooling system for electric motors. 4,137,472, Cl. 310-61.000.
Wormmeester, Gerhardus J.; and Rijsenbrij, Joannes C., to Europe Container Terminus B.V. Carriage for container transport and transfer plant for containers. 4,136,619, Cl. 104-244.100.
Wortman, Jimmie J.; Whisnant, Richard A.; and Monteith, Larry K., to Burlington Industries, Inc. Linen sorter. 4,136,778, Cl. 209-589.000.
Wright, George C.: *See*—
White, Ralph L., Jr.; and Wright, George C., 4,137,402, Cl. 542-420.000.
Wright, Lonnie C.; and Billings, David L., to General Electric Company. Control mechanism. 4,137,514, Cl. 335-220.000.
Wrue, Richard J., to Bausch & Lomb Incorporated. Artificial intraocular lens training device. 4,136,466, Cl. 35-17.000.
Wunder, William G., to Ex-Cell-O Corporation. Honing machine. 4,136,488, Cl. 51-58.000.
Wunderlich, Guenther C.: *See*—
Brooks, Frank E.; and Wunderlich, Guenther C., 4,136,835, Cl. 242-26.400.

Wurmb, Rolf: *See—*
Theysohn, Rainer; Penzien, Klaus; Seydl, Wolfgang; Wurmb, Rolf; Reimann, Horst; Cordes, Claus; and Sterzel, Hans-Josef, 4,137,212, Cl. 260-37.00N.
Wust, Reinhold: *See—*
Heine, Christian; Wust, Reinhold; and Kamp, Brig::te, 4,137,334, Cl. 426-310.000.
Wuthrich, Werner, to Autelca AG. Letterpress printing press. 4,136,614, Cl. 101-274.000.
Wycosky, Charles J. Fishing pole and reel holding bag. 4,136,478, Cl. 43-26.000.
Wydeven, Theodore J., Jr.: *See—*
United States of America, National Aeronautics and Space Administration; Wydeven, Theodore J., Jr.; and Hollahan, John R., 4,137,365, Cl. 428-412.000.
Wyler, John S., to Westinghouse Electric Corp. Probe for measuring steam quality. 4,137,462, Cl. 250-573.000.
Wyslotsky, Ihor. Slicing method. 4,136,504, Cl. 53-435.000.
Xerox Corporation: *See—*
Adams, James E.; Haas, Werner E. L.; and Dir, Gary A., 4,136,933, Cl. 350-341.000.
Mager, George E.; Nelson, Frank M.; Gillett, Kenneth; Holt, Charles P.; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; Criswell, Thomas; and Hall, Warren L., 4,137,565, Cl. 364-200.000.
Snelling, Christopher, 4,136,637, Cl. 118-658.000.
Townsend, Robert H.; and Kockler, Barry C., 4,137,449, Cl. 235-485.000.
Yagi, Masahiro: *See—*
Murai, Hiromu; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, 4,137,231, Cl. 546-242.000.
Yajima, Susumu: *See—*
Kato, Nobuhide; Yasuno, Ryo; and Yajima, Susumu, 4,136,624, Cl. 110-236.000.
Yamada, Tateyoshi: *See—*
Hara, Shigeyoshi; and Yamada, Tateyoshi, 4,137,221, Cl. 528-273.000.
Yamaguchi, Hiroaki: *See—*
Hattori, Tadashi; Nakase, Takamichi; and Yamaguchi, Hiroaki, 4,136,651, Cl. 123-119.0EC.
Yamaguchi, June: *See—*
Sera, Hidefumi; Ishii, Tsumoru; Yamaguchi, June; and Shiraishi, Hisashi, 4,137,082, Cl. 96-111.000.
Yamamichi, Masayoshi: *See—*
Mashimo, Yukio; Uchidoi, Masanori; Yamamichi, Masayoshi; Ito, Fumio; Tsunekawa, Tokuichi; and Ito, Tadashi, 4,137,541, Cl. 354-23.00D.
Yamamitsu, Chojuro; Arimura, Ichiro; Kitamura, Sadafumi; and Meki, Norio, to Matsushita Electric Industrial Co., Ltd. Drop-out responsive magnetic recording and reproducing system. 4,137,547, Cl. 358-8.000.
Yamamura Glass Kabushiki Kaisha: *See—*
Morita, Kaneji; Sugie, Akio; and Ishioka, Kunio, 4,136,832, Cl. 241-91.000.
Yamane, Tamotsu: *See—*
Sasaki, Takuya; Yamane, Tamotsu; Horibe, Yoshun; and Suzuki, Mituo, 4,136,734, Cl. 165-111.000.
Yamanouchi Pharmaceutical Co., Ltd.: *See—*
Murakami, Masuo; Takahashi, Kozo; and Ozasa, Teruaki, 4,137,407, Cl. 544-28.000.
Yamashita, Kazuo: *See—*
Akao, Masatake; Yokose, Yoshikazu; Yamashita, Kazuo; and Shibano, Takashi, 4,137,515, Cl. 336-84.00C.
Yamauchi, Mineo; and Nakahara, Masao, to Kabushiki Kaisha Mitutoyo Seisakusho. Hole gauge. 4,136,456, Cl. 33-164.00C.
Yamazaki, Masami: *See—*
Haramoto, Yutaka; Fujii, Yasuhiko; and Yamazaki, Masami, 4,137,507, Cl. 330-302.000.
yardney Company: *See—*
Arluck, Elmer M., 4,136,686, Cl. 128-90.000.
Yaso, Masao: *See—*
Tsuchihashi, Genichi; Ogura, Katsuyuki; Yaso, Masao; Kuramoto, Masashi; Fujii, Tadashiro; and Watanabe, Tetsuo, 4,137,406, Cl. 544-27.000.
Yasuda, Hirotsugu: *See—*
Kaganowicz, Grzegorz; Robinson, John W.; and Yasuda, Hirotsugu, 4,137,550, Cl. 358-128.000.
Yasue, Toshikazu: *See—*
Uno, Takeshi; Ikeda, Sadahiro; Yasue, Toshikazu; and Ejiri, Masakazu, 4,136,957, Cl. 356-394.000.
Yasuno, Ryo: *See—*
Kato, Nobuhide; Yasuno, Ryo; and Yajima, Susumu, 4,136,624, Cl. 110-236.000.
Yateman, Earl W.; and Sanderson, Gerald D., to Allis-Chalmers Canada, Limited. Shaft retainer arrangement. 4,136,768, Cl. 198-830.000.
Yau, Leopoldo D.: *See—*
Thibault, Louis R.; and Yau, Leopoldo D., 4,136,434, Cl. 29-571.000.
Ykman, Pierre: *See—*
Rodriguez, Ludovic; Leclerca, Jacques; Ykman, Pierre; and Cossement, Eric, 4,137,236, Cl. 260-306.70C.
Yogosawa, Fumio, to Sankin Kogyo, Ltd. Welding apparatus for dental purposes. 4,137,443, Cl. 219-86.210.
Yokata, Ittshu, to Ishigaki Kiko Co., Ltd., a part interest. Process for treating waste water and an apparatus therefor. 4,137,171, Cl. 210-150.000.
Yokose, Yoshikazu: *See—*
Akao, Masatake; Yokose, Yoshikazu; Yamashita, Kazuo; and Shibano, Takashi, 4,137,515, Cl. 336-84.00C.
Yokota, Yuji: *See—*
Torita, Tomohiko; Okada, Toru; and Yokota, Yuji, 4,136,819, Cl. 235-431.000.
Yokoyama, Kenji: *See—*
Iwamatsu, Masayuki; and Yokoyama, Kenji, 4,137,506, Cl. 330-288.000.
Yoneya, Kiyoo: *See—*
Kandou, Akiyoshi; and Yoneya, Kiyoo, 4,136,626, Cl. 112-235.000.
Yoshida Kogyo K K: *See—*
Kandou, Akiyoshi; and Yoneya, Kiyoo, 4,136,626, Cl. 112-235.000.
Yoshida Kogyo K.K.: *See—*
Takahashi, Kihei, 4,136,424, Cl. 24-205.11R.
Yoshida, Masafumi; and Murayama, Naohiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Thin film, thermoplastic piezoelectric switches. 4,137,475, Cl. 310-323.000.
Yoshida, Ryo: *See—*
Satomi, Takeo; Hino, Naganori; Hirano, Masachika; Mukai, Kunio; Sakamoto, Hideo; and Yoshida, Ryo, 4,137,065, Cl. 71-87.000.
Yoshikuni, Yoshiaki: *See—*
Murai, Hiromu; Enomoto, Hiroshi; Yoshikuni, Yoshiaki; Kono, Tatsuhiko; and Yagi, Masahiro, 4,137,231, Cl. 546-242.000.
Young, Clarence W., III: *See—*
Sidebotham, Norman C.; Shoemaker, Paul D.; and Young, Clarence W., III, 4,137,393, Cl. 528-491.000.
Young, Harland H., to Eberle Tanning Company. Treatment of vegetable tanning wastes. 4,137,163, Cl. 210-44.000.
Young, Roy V., II, to Corning Glass Works. Method and apparatus for detection of inclusions in glass article or the like. 4,136,961, Cl. 356-239.000.
Young, William H.: *See—*
Thompson, Harwell B.; and Young, William H., 4,136,515, Cl. 58-90.00R.
Yourke, Hannon S.: *See—*
Albrecht, Drew E.; Doran, Samuel K.; Michail, Michel S.; and Yourke, Hannon S., 4,137,459, Cl. 250-492.00A.
Yust, Paul R.: *See—*
Willer, Sharon G.; Yust, Paul R.; and Kelly, Ralph, 4,137,301, Cl. 424-45.000.
Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See—*
Winter, August; and Ott, Anton, 4,136,581, Cl. 74-689.000.
Zaitsev, Nikolai M.: *See—*
Ivanov, Jury N.; Suris, Leonid I.; Zaitsev, Nikolai M.; and Shikin, Vladimir G., 4,136,422, Cl. 24-170.000.
Zalay, Andrew W.; and Lesher, George Y., to Sterling Drug Inc. 1-Alkyl-1,4-dihydro-4-oxo-7-triazenyl-3-quinolinecarboxylic acids. 4,137,227, Cl. 260-140.000.
Zaleckas, Vincent J., to Western Electric Company. Forming isolation and device regions due to enhanced diffusion of impurities in semiconductor material by laser. 4,137,100, Cl. 148-1.500.
Zaltsman, Saul, to Silmet Ltd. Mixing capsule. 4,136,775, Cl. 206-219.000.
Zang, Hyung K.: *See—*
Reid, Robert E.; and Zang, Hyung K., 4,137,267, Cl. 260-583.00P.
Zapata, Luis: *See—*
Dahmen, David L.; and Zapata, Luis, 4,136,417, Cl. 10-27.00R.
Zardi, Umberto: *See—*
Guadalupi, Mario; Zardi, Umberto; and Lagana, Vincenzo, 4,137,262, Cl. 260-555.00A.
Zaugg, Harold E.; and Lee, Cheuk M., to Abbott Laboratories. 2,8-Disubstituted-10-hydroxy-5,5-dimethyl-1,2,3,4-tetrahydro-5H -[1]benzopyrano[4,3-c]pyridine. 4,137,232, Cl. 546-89.000.
Zdrahal, Pavel, to Meteor AG. Transmission gear for a wire guide of a winding machine. 4,136,570, Cl. 74-34.000.
Zenith Radio Corporation: *See—*
Schwartz, James W., 4,137,486, Cl. 315-366.000.
Torre, Alton J.; Retsky, Michael W.; Gioia, Norman F.; and Amin, Ramesh G., 4,137,480, Cl. 313-481.000.
Zepf, Hans-Rudolf. Shovel tooth. 4,136,469, Cl. 37-141.00T.
Ziegler, Dennis: *See—*
Helm, Herbert W.; and Ziegler, Dennis, 4,136,591, Cl. 83-355.000.
Zielinski, James: *See—*
Gardiner, John B.; Zielinski, James; Elliott, Robert L.; and Brois, Stanley J., 4,137,185, Cl. 252-33.000.
Zielke, Clyde W.; and Gorin, Everett, to Continental Oil Company. Production of a hydrogen-rich gas from a hydrogen, carbon monoxide and carbon dioxide-containing fuel gas. 4,137,298, Cl. 423-648.00R.
Ziesmer, Randall A., to Honeywell Inc. Phase shifting apparatus. 4,137,503, Cl. 328-155.000.
Zimmer U.S.A.: *See—*
Pastrick, Dan L.; and McDaniel, John M., 4,136,405, Cl. 3-1.911.
Zoecon Corporation: *See—*
Siddall, John B., 4,137,273, Cl. 568-648.000.
Zwijnenburg, Arie: *See—*
Meihuizen, Cornelis E.; Pennings, Albertus J.; and Zwijnenburg, Arie, 4,137,394, Cl. 528-502.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF JANUARY, 1979

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Allied Paper, Inc.: *See*—
Shaw, Michael J., Re. 29,893, Cl. 428-446.000.
Bayne, Gilbert M., to Merck & Co. Inc. Composition and method of treating dopamine deficiency in brain tissue. Re. 29,892, Cl. 424-319.000.
EMI Limited: *See*—
Hounsfield, Godfrey N., Re. 29,894, Cl. 250-360.000.
Fuse, Yuzo: *See*—
Murata, Hiroshi; Inose, Akiyoshi; Sawai, Masahide; and Fuse, Yuzo, Re. 29,895, Cl. 313-411.000.
Gilcher, Heinz, to Westinghouse Electric Corp. Intrusion detection system. Re. 29,896, Cl. 340-261.000.
Gomberg, Edward N., to Synair Corporation. Flat free pneumatic tire and void free filling therefor. Re. 29,890, Cl. 152-313.000.
Hounsfield, Godfrey N., to EMI Limited. Radiography. Re. 29,894, Cl. 250-360.000.
Inose, Akiyoshi: *See*—
Murata, Hiroshi; Inose, Akiyoshi; Sawai, Masahide; and Fuse, Yuzo, Re. 29,895, Cl. 313-411.000.
Klein, Michael B. Crown remover. Re. 29,889, Cl. 32-43.000.
Merck & Co. Inc.: *See*—
Bayne, Gilbert M., Re. 29,892, Cl. 424-319.000.
Murata, Hiroshi; Inose, Akiyoshi; Sawai, Masahide; and Fuse, Yuzo, to Sony Corporation. Convergence means for a plural beam color picture tube. Re. 29,895, Cl. 313-411.000.
Phillips, Bryce W., to Reynolds Metals Company. System for detecting small openings in hollow bodies. Re. 29,891, Cl. 356-237.000.
Reynolds Metals Company: *See*—
Phillips, Bryce W., Re. 29,891, Cl. 356-237.000.
Sawai, Masahide: *See*—
Murata, Hiroshi; Inose, Akiyoshi; Sawai, Masahide; and Fuse, Yuzo, Re. 29,895, Cl. 313-411.000.
Shaw, Michael J., to Allied Paper, Inc. Lithographic printing plate and method of making the same. Re. 29,893, Cl. 428-446.000.
Sony Corporation: *See*—
Murata, Hiroshi; Inose, Akiyoshi; Sawai, Masahide; and Fuse, Yuzo, Re. 29,895, Cl. 313-411.000.
Synair Corporation: *See*—
Gomberg, Edward N., Re. 29,890, Cl. 152-313.000.
Westinghouse Electric Corp.: *See*—
Gilcher, Heinz, Re. 29,896, Cl. 340-261.000.

LIST OF PLANT PATENTEES

Craig, Donald E. Apple tree. 4,372, 1-30-79, Cl. 35.000.

LIST OF DESIGN PATENTEES

Adkinson, Joseph E. Lounge chair. 250,922, 1-30-79, Cl. D6-73.000.
American Hospital Supply Corporation: *See*—
Mosior, Donald J., 250,963, Cl. D24-27.000.
Anderson, Rudolph E. Cruciform key blank. 250,932, 1-30-79, Cl. D8-348.000.
Appelblatt, Irving, to Cadillac Gage Company. Armored vehicle. 250,942, 1-30-79, Cl. D12-12.000.
Astro Optics Corporation: *See*—
Schueler, Arthur P., 250,936, Cl. D10-111.000.
Schueler, Arthur P.; and Nagel, Robert L, 250,937, Cl. D10-111.000.
Barr, Josef J. Pendant or similar article. 250,939, 1-30-79, Cl. D11-79.000.
Bergamaschi, Giovanni. Sole for footwear. 250,943, 1-30-79, Cl. D2-320.000.
Bitner, Kenneth M., Jr.; Murray, Robert E.; and Hodges, Charles R. Desk file. 250,960, 1-30-79, Cl. D19-90.000.
Bonsack, Horst G. Combined bathtub and shower stall. 250,961, 1-30-79, Cl. D23-49.000.
Bonsack, Horst G. Bathtub. 250,962, 1-30-79, Cl. D23-55.000.
Burroughs Corporation: *See*—
Clayton, Richard G.; and Sims, Jerry J., 250,951, Cl. D14-44.000.
Cadillac Gage Company: *See*—
Appelblatt, Irving, 250,942, Cl. D12-12.000.
Clayton, Richard G.; and Sims, Jerry J., to Burroughs Corporation. Computer system. 250,951, 1-30-79, Cl. D14-44.000.
Combest, H. E. Buddy. Ring for lighting fixture. 250,968, 1-30-79, Cl. D48-7.00A.
Compagnie Generale des Etablissements Michelin: *See*—
Germain, Bernard, 250,946, Cl. D12-146.000.
Dolinsky, Dennis P., to Uniroyal, Inc. Sole for footwear. 250,918, 1-30-79, Cl. D2-320.000.
Donley, Donald J.; and Watson, Richard E., to Kendon Manufacturing Company, Inc. Carrier for a citizen's band radio unit or the like. 250,974, 1-30-79, Cl. D87-1.00R.
Eastman Kodak Company: *See*—
Hansen, David E., 250,958, Cl. D16-06.000.
Eberle, Gunter, to Vecta Contract, Inc. Chair. 250,923, 1-30-79, Cl. D6-73.000.
Edstrom, Richard C.: *See*—
Gerstman, Richard B.; Meyers, Herbert M.; and Edstrom, Richard C., 250,929, Cl. D7-28.000.
Effort, Wayne A. Simulative toy vehicle. 250,967, 1-30-79, Cl. D34-15.0AM.
Exmet Corporation: *See*—
Felsenthal, Peter, 250,975, Cl. D92-26.000.
Fannin, Howard M. Digital darkroom timer. 250,934, 1-30-79, Cl. D10-40.000.
Felsenthal, Peter, to Exmet Corporation. Expanded metal sheet. 250,975, 1-30-79, Cl. D92-26.000.
Finn, Norman H., to United States Shoe Corporation, The. Laced open toe wedgie. 250,916, 1-30-79, Cl. D2-286.000.
Flanigan, Mary Ann B.; and White, Maryanne G. Rack for tennis rackets. 250,925, 1-30-79, Cl. D6-125.000.
Franklin, Donald M. Partitioned plate. 250,928, 1-30-79, Cl. D7-27.000.
Franklin, Donald M. Bowl. 250,930, 1-30-79, Cl. D7-36.000.
Germain, Bernard, to Compagnie Generale des Etablissements Michelin. Tire. 250,946, 1-30-79, Cl. D12-146.000.
Gerstman, Richard B.; Meyers, Herbert M.; and Edstrom, Richard C., to Nestle Company, Inc., The. Food container. 250,929, 1-30-79, Cl. D7-28.000.
Girling Limited: *See*—
Pickering, John F., 250,948, Cl. D12-155.000.
Hackenberg, John E. Combined aquarium and light fixture. 250,969, 1-30-79, Cl. D48-20.00D.
Hansen, David E., to Eastman Kodak Company. Photographic camera or similar article. 250,958, 1-30-79, Cl. D16-06.000.
Helsm, John D., to Matchpoint Industries, Inc. Clip-on towel holder. 250,924, 1-30-79, Cl. D6-99.000.
Hodges, Charles R.: *See*—
Bitner, Kenneth M., Jr.; Murray, Robert E.; and Hodges, Charles R., 250,960, Cl. D19-90.000.
Iwatsu Electric Co. Ltd.: *See*—
Yoshikawa, Hironori, 250,955, Cl. D14-58.000.
Yoshikawa, Hironori, 250,956, Cl. D14-58.000.
Kendon Manufacturing Company, Inc.: *See*—
Donley, Donald J.; and Watson, Richard E., 250,974, Cl. D87-1.00R.
Knodt, Ruediger W.; and Warren, Robert E., to Xerox Corporation.

Control console module for a computer printer. 250,950, 1-30-79, Cl. D14-42.000.
Knodt, Ruediger W.; Warren, Robert E.; and Spowart, James R., to Xerox Corporation. Modular computer printer. 250,953, 1-30-79, Cl. D14-50.000.
Knodt, Ruediger W.; Warren, Robert E.; and Spowart, James R., to Xerox Corporation. Modular computer printer. 250,954, 1-30-79, Cl. D14-50.000.
Knodt, Ruediger W.: *See—*
Spowart, James R.; Warren, Robert E.; and Knodt, Ruediger W., 250,952, Cl. D14-50.000.
Lewis, Donald W. Crayon display unit. 250,927, 1-30-79, Cl. D6-146.000.
Litzenberger, Herbert: *See—*
Milligan, William N.; and Litzenberger, Herbert, 250,919, Cl. D2-400.000.
Lokvig, Tor. Letter scale. 250,935, 1-30-79, Cl. D10-87.000.
Magee, Bervin W.; and Magee, Betty A. Plant container. 250,940, 1-30-79, Cl. D11-152.000.
Magee, Betty A.: *See—*
Magee, Bervin W.; and Magee, Betty A., 250,940, Cl. D11-152.000.
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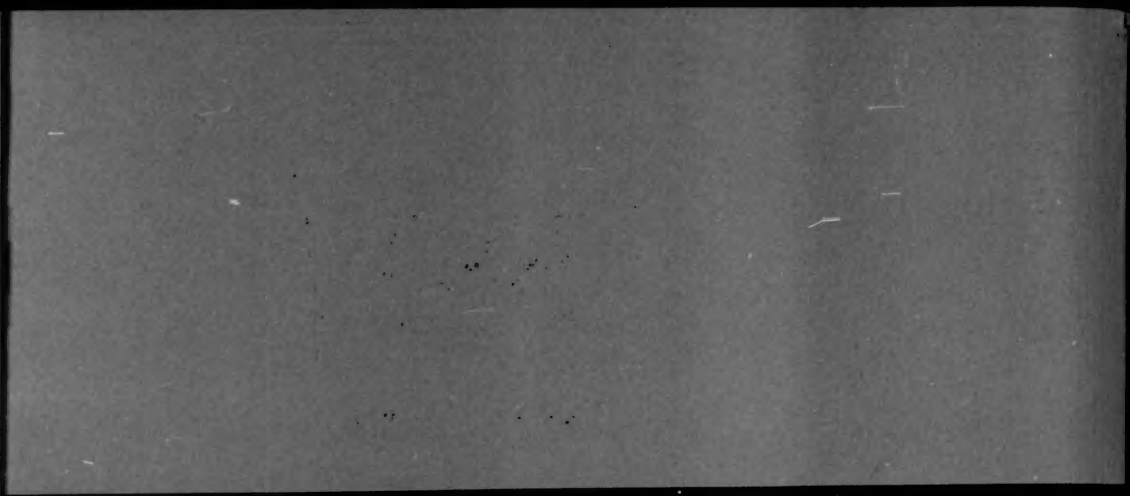

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